REPORT RESUMES

ED 015 177 24 TE 000 071

SUMMER WRITING CONFERENCE TO CONTINUE DEVELOPMENT OF MATERIALS IN EXPRESSION OF IDEAS (ENGLISH) AND QUANTITATIVE THINKING (MATHEMATICS) TO BE USED IN PRE-COLLEGE CENTERS FOR STUDENTS FROM LOW-INCOME FAMILIES. FINAL REPORT.

EDUCATIONAL SERVICES INC., NEWTON, MASS.
REPORT NUMBER BR-6-1700 PUB DATE 31 MAY 67
CONTRACT OEC-1-6-061700-1735
EDRS PRICE MF-$0.75 HC-$5.88 145P.

DESCRIPTORS- *COLLEGE BOUND STUDENTS, *COLLEGE HIGH SCHOOL COOPERATION, *CONFERENCES, *DISADVANTAGED YOUTH, *ENGLISH INSTRUCTION, UNDERACHIEVERS, MATHEMATICS, SCIENCE UNITS, CURRICULUM DEVELOPMENT, TEACHER WORKSHOPS, UPWARD BOUND CENTERS, PRE-COLLEGE CENTERS,

TEACHERS, WRITERS, MATHEMATICIANS, AND SCIENTISTS FROM HIGH SCHOOLS AND UNIVERSITITES IN 10 STATES MET TO CONTINUE THE DEVELOPMENT OF UNITS IN ENGLISH, MATHEMATICS, AND NATURAL SCIENCE, FOR USE IN PRE-COLLEGE AND UPWARD BOUND CENTERS. THEIR AIM WAS TO CREATE CURRICULUM MATERIALS WHICH WOULD HELP TEACHERS AID INTELLECTUALLY DISCOURAGED STUDENTS TO BECOME CONFIDENT IN THEIR ABILITY TO THINK, SPEAK, AND WRITE PRODUCTIVELY. DURING THE 8-WEEK CONFERENCE, SOME OF THE 28 PARTICIPANTS TRAVELED TO UPWARD BOUND CENTERS FOR DEMONSTRATION AND EXPERIMENTATION OF THE EVOLVING MATERIALS, THEN RETURNED TO REVISE AND DISCUSS RESULTS WITH OTHER CONFERENCE MEMBERS. THIS WAS FOLLOWED BY A WEEK-LONG TEACHERS' WORKSHOP IN WHICH UPWARD BOUND TEACHERS WHO HAD BEEN USING SOME OF THE PREVIOUSLY CONSTRUCTED MATERIALS MET WITH THE PARTICIPANTS OF THE WRITERS' CONFERENCE FOR DISCUSSION. ALTHOUGH TEACHERS AND STUDENTS INVOLVED WERE ENTHUSIASTIC ABOUT THE PROGRAM A FORMAL EVALUATION IS NOT YET AVAILABLE. (INCLUDED IN THIS REPORT ARE (1) BACKGROUND INFORMATION ON PRE-COLLEGE AND UPWARD BOUND CENTERS, (2) A DESCRIPTION OF THE PREPARATION OF A UNIT, (3) A SAMPLE UNIT, INCLUDING TEACHER FEEDBACK AND STUDENT WRITINGS, (4) ANNOTATED LISTS OF AVAILABLE ENGLISH, MATHEMATICS, AND SCIENCE UNITS, AND (5) A DESCRIPTION OF THE TEACHERS' TRAINING SESSIONS HELD AT THE VARIOUS CENTERS. A BROCHURE, "TO GLADLY LEARN," AND A SUMMARY OF THE REPORT ARE APPENDED.) (MM)

BR-1700
FA 24

ED015177

FINAL REPORT-May 31, 1967
Office of Education
Contract No. OEC-1-6-061700-1735
Educational Services Incorporated
Curriculum Resources Group
55 Chapel Street
Newton, Massachusetts 02160

TE 000 071

BR-6-1700
PA-24
TE 000 071

Educational Services Incorporated
Curriculum Resources Group
55 Chapel Street
Newton, Massachusetts 02160

Office of Education
Contract No. OEC-1-6-061700-1735

FINAL REPORT

May 31, 1967

Summer Writing Conference to continue development of materials in expression of ideas (English) and quantitative thinking (Mathematics) to be used in Pre-College centers for Students from Low-Income Families.

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

TABLE OF CONTENTS

I. Introduction

II. Background of Project

A short history of the Curriculum Resources Group from its beginning as the Pre-College Program for Students from Low-Income Families in the spring of 1964 includes a brief account of its activities during the past three years.

III. General Aims

The English and mathematics groups summarize their broad aims for the conference and stress the conviction that a remedial program is not the solution but that fresh, provocative material must be developed that will allow students to think freely and speak freely, to ask questions and find answers, with the teacher serving as guide rather than authority.

IV. List of Participants and Visitors

V. Procedures

A. Eight-week writing conference
A brief account of the schedule and activities of the conference itself and of the rationale for selecting the participants is followed by an explanation of the program of center visits.

Supplements:

1. Draft of Statement about Teaching
2. Excerpts from Traveler's Reports

B. Teachers' Workshop
The one-week teachers' workshop brought teachers using the materials into conversations with participants in the eight-week writing conference. The exchange of ideas was valuable for both teachers and writers, and encouraged teachers to become innovators themselves.

C. Continuation of Work After Summer
CRG staff and consultants continue to prepare and revise materials developed during the summer.

D. Preparation of a Unit
As an example of the effort involved in this method of curriculum development a description of the preparation of a single unit is given, including teacher feedback and student writing samples.

VI. Annotated Lists of Mathematics and English Units

VII. Evaluation

A brief account of evaluation is illustrated by excerpts from a teacher's comments.

VIII. Teacher Training and Dissemination of Information Concerning Materials Produced

An account of teacher training and orientation sessions.

Supplements

1. A Discussion on Education Between Student and Teacher
2. Excerpts from an Account of a Teacher Orientation

IX Materials Distribution

Plans for publication and possible future directions are discussed, schools and programs using the materials are listed, and the need for innovative and academically significant curriculum materials is stressed.

Appendix To Gladly Learn

INTRODUCTION

A summer writing conference to continue development of materials in expression of ideas (English) and quantitative thinking (Mathematics) to be used in Pre-College Centers for Students from Low-Income families was held on the Pine Manor Junior College campus in Chestnut Hill, Massachusetts during the summer of 1966. The conference was supported by a grant from the Office of Education, and administered by Educational Services Incorporated. The eight-week writing conference brought together 28 teachers, writers, mathematicians and scientists from high schools and universities in ten states. The final one-week teachers' workshop was attended by 33 teachers from eight Upward Bound centers which had used the curriculum materials earlier in the summer.

The writer-participants spent the summer revising and evaluating existing units, and developing new units in the broad areas of English, mathematics and natural science. English was interpreted to include anything that would encourage the expression of ideas - in writing, thinking or speaking. Materials included art and music and film and history as well as literature, reading and speech. Similarly mathematics was considered to be anything that would encourage quantitative thinking and logical inquiry. A start was also made in developing units in the biological and physical sciences.

Some of the new units were sent to selected teachers at the centers early in the fall, and on the basis of feedback from them, staff members and some of the participants were able during the academic year to prepare units for use at centers in the 1967 summer program. An amendment was requested and granted extending the expiration date of the contract from December 31 to May 31 to allow continuation of editing and revision and reproduction of these materials. A second extension was granted to June 30, 1967.

BACKGROUND OF PROJECT

The Pre-College Program for Students from Low-Income Families was conceived during the spring of 1964 as part of an effort to strengthen and improve the predominantly Negro colleges by helping to decrease their very large (approximately 70%) dropout rate. Six centers were established at Dillard University (New Orleans), Fisk University (Nashville), Howard University (Washington),Morehouse College (Atlanta), Texas Southern University (Houston) and Webster College (St. Louis) and began Saturday classes in March 1965, with financial support from the Carnegie Corporation of New York. Beginning in June 1965, support for the six pre-college centers was assumed by the Office of Economic Opportunity, and the emphasis of the program shifted slightly from an attack on the dropout problem to a campaign to increase the opportunities and the potential success in college of students from low-income families.

Conferences for the preparation of our materials were held during the summers of 1964 and 1965 at Pine Manor Junior College in Wellesley and at Wheelock College in Boston. These eight-week sessions involved teachers from high schools and colleges gathered together for the purpose of developing a program for high school students from low-income families to enhance the probability of their entering college and of their finding college interesting, provocative and worthy of great effort.

The program in the six centers has been financed since June 1965 by the Office of Economic Opportunity in each of the cities involved. OEO provided approximately $600,000 for the operation of the eight-week summer residential programs and a similar amount for the Saturday morning programs during the academic year. The six-center program is considered to be a demonstration project, and OEO granted nearly $90,000 for an evaluation study.

The Program for Pre-College Centers for Low-Income Families has operated under the direction of the Curriculum Resources Group based at Educational Services Incorporated in Watertown, Massachusetts. In November 1966 Institute for Services to Education, with headquarters in Washington, D.C., assumed the administrative responsibility for the CRG which has the responsibility for generating and supplying the course materials, providing for teacher training and orientation, presenting general guidelines for classes as well as for the afternoon cultural program in the summer, recruiting and organizing visits by consultants and critics, conducting the overall supervision of the centers, and designing the evaluation study. The activities of the Curriculum Resources Group have been financed by a grant from the Carnegie Corporation of New York from September 1, 1964, until May 31, 1967.

See also Appendix A, To Gladly Learn, a brochure describing the program.

GENERAL AIMS

The English portion of the Summer 1966 writing conference had three broad aims:

1. To continue to prepare individual units for use during two summer sessions and on Saturdays during the academic year in Upward Bound programs and for other schools and colleges interested in such material. These encompassed creative writing, speech, reading and history as well as literature.
2. To develop an experimental sequence of four or five units which would incorporate some of the techniques of the individual units, such as role-playing and other forms of personal student involvement, while at the same time building in to each successive unit a reinforcement of the literary skills developed in the preceding ones. Students would gradually begin to apply these skills in their reading almost unconsciously, instead of having memorized an artificial set of "rules" imposed on them from some outside authoritative source.
3. To develop a procedure for preparing units concerned with longer, full-length works of fiction and non-fiction that would stress the personal and contemporary relevance of such works, hoping to overcome the common student response of "What has this got to do with me?", while enabling students to develop a critical attitude and vocabulary necessary for a literary appreciation of such works.

The mathematics and science portion of the 1966 writing conference had broad aims very similar to those in English:

1. To continue preparation of individual units in mathematics and to begin a series in the natural sciences.
2. To develop experimental sequences of several units.
3. To design mathematics and science units that would have qualities of fun and therefore involvement, and novelty or non-school associations while at the same time basic concepts are employed. The intention was not to provide introductory, supplementary or essential curriculum material but to start from experience in the student's immediate environment, drawing on his own fund of observations, encouraging him to watch and work without necessarily covering a given amount of formal material.

It is both difficult and time-consuming to develop the kind of fresh, provocative material that seems to be most effective. New ideas are not easy to come by, and once written down have to be tested in discussions with other teachers, tried out in as many classrooms as possible, prepared and edited according to the responses of various teachers and students using the material. The group was convinced from the beginning that a remedial program was not the solution. Although some of the subject matter is conventional, the way in which it is presented is not at all so. The emphasis is on allowing the students to think freely and speak freely, to ask questions and find answers, with the teacher serving as guide rather than authority.

We have come to take for granted the value of learning certain things; this is suggested by the frequency and ease with which we are able to substitute the verb "to learn" from the verb "to study". Even when students study American history they are expected to learn something on which they will be tested. It would seem more useful to study by examining, analyzing and raising questions, to understand the nature and various aspects of a problem before trying to solve it. In this program our objectives for students are primarily the development of habits of inquiry, of attitudes and values, with the acquisition of knowledge as the secondary goal.

Many teachers hesitate to leave the old for the new; teachers who have always used texts discard them reluctantly for something else; teachers who have always "covered the subject" hesitate to leave things out; teachers who have always drilled facts into their students' heads must be persuaded to adopt new teaching techniques. Our aim has been to design a body of material that teachers can use to create an open and more flexible classroom situation. Our units take conventional topics and place them within a frame of reference that will naturally demonstrate their relevance. We feel that crucial to educating the student is allowing him to discover by what appears to be his own effort that certain heretofore "academic", and therefore apparently remote and irrelevant, topics are indeed important because they vitally influence his existence or describe forces that influence his existence. If the description is naturalistic we are involved with a science or social science; if the description is metaphorical we are in the arts. In either case the purpose of the class is to heighten the student's sensitivities to the point where he can seek a solution to problems, esthetic as well as scientific, based on an assessment of his own condition within a world in which the coterminous existence conflicting values and systems at least suggest the absence of any clearly defined rational course natural for all.

In a sense society in its striving for order misleads students by creating within a sea of chaos an artificial order -- the educational system. As a matter of fact, by emphasizing facts and holding students accountable for irrelevant solutions, society severely handicaps itself. It does not develop as many minds as it could who might turn their attention to the chaos and do something about it.

NOTE: Many of the units in English, Mathematics and Science developed during the summer have been submitted during the year in the monthly Technical progress reports. Annotated lists of the units prepared are included in Section VI of this report.

LISTS OF PARTICIPANTS AND VISITORS

A. Participants in eight-week writing conference

Irving Adler, Author and Lecturer (Math) July 5 - 15

John Alexander, Boston State College (Math) June 20 - August 19

William L. Barclay III, Commonwealth School (Science) June 20 - July 29

William T. Brown, Howard University (English) June 20 - August 12

Jeffrey Camhi, Harvard University (Science) June 20 - August 12

Maxine Daly, Cardozo High School (English) July 5 - 22

Arthur Davis, Howard University (English) June 20 - August 19

Lee Evans, Newton Public Schools (Math) June 20 - August 19

Ann Flagg, Cook County Public Schools (English) June 27 - August 12

Sister Josette Ford, Webster College (English) June 20 - August 12

Marvin Fridley, St. Louis Public Schools (Science) June 20 - August 12

Norman Friedman, Queens College (English) June 20 - August 12

Leroy Giles, Howard University (English) June 20 - July 29

Newcomb Greenleaf, University of Rochester (Math) June 20 - July 15

Peter Hilton, Cornell University (Math) August 1 - 5

Jonathan Kozol, Writer and teacher (English) June 20 - August 12

Lawrence Langer, Simmons College (English) June 20 - August 12

Dane Morgan, Commonwealth School (Science) June 20 - August 12

Sandra Pearson, Newton Public Schools (Speech) June 27 - July 15

Davenport Plumer, Harvard University (Reading) July 14 - 19

David Pradell, Brookline Public Schools (Science) June 20 - August 12

Roberta Rabinoff, Cardozo High School (English) June 20 - August 12

John Rier, Howard University (Science) June 27 - July 29

David Seligson, Duke University (Science) June 27 - August 19

Conrad Snowden, Howard University (English) July 5 - August 19

Robert Solem, Dillard University (English) June 27 - August 5

Walter Talbot, Morgan State University (Math) August 1 - 19

Mary Wilburn, Cardinal Cushing College (English) June 27 - August 12

B. Visitors and Consultants

Charles Haynie, Cornell University (Math)

John Hawkes, Brown University (English)

Phyllis Klein, Illinois Arithmetic Project (Math)

Philip Morrison, Massachusetts Institute of Technology (Science)

Lee Osburn, Illinois Arithmetic Project (Math)

Alfred Redfield, IBM Watson Laboratory (Science)

C. Participants in Teachers' Workshop

English

Teachers from Upward Bound programs using CRG material

Doris Adler, Howard
Louis Becker, Emory
James Bishop, Morehouse
Roberta Deason, Texas Southern
Gail Donovan, Morehouse
Sister Alene Faul, Webster
Betty Francis, Dillard
Cleo Gray, Howard
Betsy Hendricks, Fisk
Dorothy Lawrence, Texas Southern
Mason Lowance, Morehouse
Cora Macdonald, Dillard
Burton Melnick, Dillard
Minnie Miles, Fisk
Carol Reed, Texas Southern
Eleanor Traylor, Howard
Mary Walker, Fisk
Donald Wiener, Texas Southern

Consultants

Arthur Davis, Howard
Sandra Pearson, Newton
Davenport Plumer, Harvard
Susan Thomas,

Mathematics

Teachers from Upward Bound programs using CRG materials

William T. Briggs, Fisk
Riley Elliott, Fisk
John Ernst, Webster
Richard Gowell, Dillard
Alice Hankla, Morehouse
Richard Hatfield, Fisk
Melvin Hodges, Dillard
Beverly Jacques, Dillard
Frances Jeter, Fisk
Sister John Elizabeth, Webster
Virginia Merrill, Bowdoin
Gladys Richardson, Morehouse
William Riggan, Tufts
Juanita Stiles, Howard
Harold Tate, Texas Southern

Consultants

John Alexander, Boston State College
Lee Evans, Newton
Newcomb Greenleaf, University of Rochester
David Pradell, Brookine
Walter Talbot, Morgan State University

PROCEDURES

A. Eight-week writing conference

The Summer Writing Conference held its opening session at Pine Manor Junior College in Chestnut Hill, Massachusetts on June 20, 1966. The first day's program included a brief account of the history of Educational Services Incorporated, of Institute for Services to Education, of the work of the Program for Pre-College Centers (now part of the Curriculum Resources Group) and an introduction to the materials themselves, using the group of participants as a class.

The writer-participants (listed in Section IV) worked individually or in small groups and came together periodically to discuss their ideas. Two participants from each field spent a week at each of the six Upward Bound centers affiliated with the Curriculum Resources Group, meeting with teachers, observing classes and trying some of the new ideas and units being developed. All of them were at Pine Manor for a week in mid-July to report on their experiences at the centers and to hear the discussion of the work done at the conference, Several other participants, both in English and math, visited one or two centers to try out the units they were preparing. The last week of the conference, August 14 - 19 was devoted to a Teachers' Workshop, with participants (listed in Section IV) from those Upward Bound centers using Curriculum Resources Group materials. Teachers concentrated on developing new units that had grown out of their experiences in the centers and on evaluating the present materials and methods of teacher orientation.

The flexible physical set-up at Pine Manor made possible the close and frequent interaction of members of the writing conference, who could "try out" ideas on each other at regularly scheduled or informal meetings, work together on ideas requiring the special talents of more than one individual, and in general provide one another with the stimulating intellectual cross-fertilization that leads to fruitful innovation. Especially because the pre-college program constitutes a bridge between high school and college we felt it was important to draw on a cross-section of creative potentialities from a wide variety of backgrounds: members of the conference included high school and college teachers, a poet, a novelist (who is also an elementary school teacher), a drama director, a science writer and lecturer, and a medical student. Conferees ranged widely in age - from 25 to 60; included men and women, black and white. Occasionally visitors and consultants involved in other curriculum development programs would come by to join in the discussions, share their experiences, and offer comments and criticisms on the work of the conference. Experience in the past had indicated that too many persons drawn from similar backgrounds and educational interests could lead to quibbling and ultimate frustration. The summer of 1966 confirmed our conviction that diversity among the members of a conference produces good ideas and new and fresh educational materials.

Because of its contractual arrangement with six Upward Bound centers in the South, the Curriculum Resources Group had a unique opportunity to send those conferees preparing units to at least one center, to confer with teachers, observe classes, try out their own units, and discuss responses with teachers and students. They would then return to Pine Manor and revise their work, in line with their experience in the classroom. The personal contact made possible by this arrangement proved invaluable in the preparation and revision of units, since authors themselves could introduce many of the changes suggested by the trial teaching, with the feeling that they were not working in a vacuum, but with a vivid and concrete sense of how the material might be used in an educational situation. The gulf between the innovator and the students for whom the innovation is being undertaken is accordingly diminished, and the results are far more directly relevant to the educational needs, abilities, and aspirations of the students.

Participants who visited centers, observing classes and discussing teaching problems, reported that there seemed to be a great deal of misunderstanding about teaching methods best for the curriculum. In an attempt to clear up differences, several afternoon meetings were held by small groups who drafted what they considered the CRG teaching rationale. Included at the end of this section as Supplement I a draft statement prepared by the entire group as an introduction to our way of teaching for new staff members and consultants:

I. What do we mean by effective teaching?

II. What should be the relations between the teacher and the unit?

III. What is the most meaningful classroom situation?

It was decided that this statement should not be sent to teachers but might be used as a guide for consultants in their discussions with teachers. The chief value of the statement was the opportunity for those who wrote it to clarify their own thoughts. The process of preparing it seemed more significant than the result, but the statement might serve as a stimulus for starting similar conversations at the centers and reinforcing the role that sensitivity must play in a classroom.

Two participants from each field, Carolyn Fitchett and Sister Josette Ford in English, and John Alexander and Lee Evans in mathematics, spent a week at each of the six Upward Bound centers affiliated with the Curriculum Resources Group, meeting with teachers, observing classes, and trying some of the new units being developed. All of them returned in mid-July (in spite of the airlines strike) to report on their experiences at the centers and to participate in the discussion of the work done at the conference. Travelers' accounts were included in the Technical Progress Reports for July, August and September. They recount visits to classrooms and discussions with teachers and students, units that are used successfully and some that are not. Examples from two of these travelers' reports are included at the end of this section as Supplement 2.

B. Teachers' Workshop

An innovation introduced at this summer's writing conference was a one-week teachers' workshop at the end of the session. On the basis of recommendations by center visitors, teachers who had been using our materials and who seemed to have creative ideas of their own were selected to come to Pine Manor, where they had an opportunity to discuss their experiences in teaching the units with the editors responsible for revising and improving them. Such feedback has proved to be invaluable. The teachers in turn gained a sense of meaningful participation in the program by being able to meet the members of the writing conference and exchange ideas freely with them. If curriculum innovation is to be successful, classroom teachers need to realize that they are as integral a part of the process as the innovators themselves. Both the teachers returning to their classes in Upward Bound follow-up programs during the school year and participants developing the material profited from the interchange. To develop student motivation one must have teacher motivation as well. In an experimental program of this sort, in which teachers are asked to use unfamiliar materials in unfamiliar ways, it is imperative that teachers as well as students lose the feeling of being members of a captive audience, carrying out the orders, or learning the facts imposed by an authority. They left the workshop with a clearer sense of their relationship to the people creating the units, a deeper insight into the implications of the material they were teaching, and a reinforced commitment to the methods for presenting it in the classroom. Perhaps the greatest value of such a workshop is the feeling it gives the teacher for the vital role he plays in the development and use of new curriculum material, thus providing him with training and orientation in the most comprehensive meanings of these terms.

An additional asset of the workshop week was that the teachers participating were given an opportunity to write their own units. One week was a short time, and in many cases the products were in a very elementary stage, but the process gave teachers an inside view, as it were, of the nature of innovation. We hope that teachers will become their own innovators, responding to a flexible classroom situation in which new material and procedures are constantly being introduced, tried, revised, adapted and incorporated into an ever-changing curriculum. Eventually, though this is a long-term goal, programs like Upward Bound and organizations like the Curriculum Resources Group may become obsolete as teachers become secure enough to find their own imaginative solutions to the problems of an open-ended classroom that emphasizes students learning rather than teachers teaching. If our present experiment proves that this way of proceeding is valid and is succeeding with the students, then perhaps such special projects will no longer be necessary as their work is taken over by teachers themselves, both in high school and college. Insofar as the 1966 workshop teachers returned enthusiastically to their posts with a clearer sense of the possibilities of innovation and a firmer confidence in their own abilities to participate in it, the writing conference can be judged a positive step toward the long-term goal mentioned above.

C. Continuation of work after summer

A small group of writer-participants continued to work on materials, either as members of the CRG permanent staff or as consultants. Several times during the academic year of 1966-67 both the English and mathematics editorial boards met in the CRG offices in Newton to discuss the editing and revision of summer materials on the basis of feedback from a few selected teachers. Some of the summer units were used during the academic year, and more are going to be used by second year students in the six affiliated Upward Bound centers during the summer of 1967.

Work continued on both speech and reading programs begun during the summer, with the speech program approaching the problem through a study of dialects, and the reading program beginning with an emphasis on a feeling for words.

REPORT OF PROGRESS

The Summer Reading Program

This program is designed to make the student participating in it self-conscious in his relation to words. Reading is an experience; we assume that any reader, but especially the poor one, will benefit from the investigation of that experience, and from the knowledge of what he wants it to do for him. We would lay a foundation of study solid enough and broad enough so that he can judge words for their impact and implied attitude as well as in their literal meaning.

The starting place is the word itself. By asking basic questions: How does the name of a thing differ from the thing itself? What use are words if they have no direct physical effect on reality? - we hope to create an atmosphere of relevant speculation about man's basic tool. The units then proceed to the word in context, drawing material from all literary genres, fiction and non-fiction both. The inherent properties of words make possible certain strong effects; the techniques used in creating them are analyzed. From imagery, point of view, and tone the units move on to a linguistic analysis of irony, satire, and other more sophisticated literary stances, ones often impenetrable to people who read for "meaning" alone. The final units will investigate the capacities and techniques peculiar to the various genres: the poem, the play, prose fiction, and non-fiction.

A "feeling for words" is built on sensuous experience of them at least as much as on intellectual understanding. The attempt has been to make these units as sensuously rich as possible by using material from all the arts to facilitate and reinforce learning. The very classroom atmosphere can become a resource. The procedure of the units encourages questioning and personally relevant response; no attempt is made to inculcate the terminology of literary analysis. Writing assignments within each unit have been constructed on the assumption that doing something in his own writing (however modestly) and then recognizing it there will aid the student in recognizing and appreciating that quality in someone else's work.

The Summer Speech Program

The dialect materials which were developed at the Writing Conference during the Summer of 1966 were the result of our dissatisfaction with past approaches to the teaching of speech. They are intended to replace not only the traditional methods of teaching remedial speech and public speaking but also the more recent techniques of teaching English as a second language to culturally discouraged youngsters. We believe that approaching speech problems through a study of dialects can have a positive psychological effect on "non-standard" speakers and that it hopefully may result in clearer speech. At this point, however, we are limiting our objectives to clearer communication; we are not attempting to teach standard speech either as a replacement of or a substitution for non-standard or any other speech patterns.

The first step in the dialect unit, which is a study of Cockney dialect through the use of songs from "My Fair Lady" and excerpts from Shaw's Pygmalion, has been completed. In March, 1967, we sent a copy of these materials for comment to Raven McDavid, a dialectologist from the University of Chicago.

At the present time, we are developing materials for the culminating section of the unit. These materials are designed to give the students an opportunity to explore the complexity of speech. More specifically, the purpose of this section is to give the students a broader understanding of the effects of their speech on others and on themselves.

D. Preparation and development of a unit

A major problem confronting the writing conference in the summer of 1966 was how to create units concerned with full-length works without simply reproducing the familiar teacher's or student's guide that usually gives both questions and answers without challenging the imagination of the reader. We were not even certain whether it was possible to do this; almost all of our earlier efforts had been directed toward developing brief "discussion" units, which would encourage students to talk spontaneously, or units dealing with conceptions like style and point of view that required a minimum amount of reading. These units had been successful enough so that students began to demand longer works, novels and plays. The question was how to respond to this need without adopting the conventional approach of "For next meeting read the following chapters and be prepared to discuss them." As an example of the effort involved in this kind of curriculum development, a description of the preparation of a single unit - The Cool World - is given below, including teacher feedback and student writing samples which were the outcome of trial in the classroom.

The imperative task was to find a novel that was unfamiliar enough to the students so that they would not have any "built-in resistance" to it and, hopefully, unfamiliar enough to teachers so that they would not have any "prepared" academic method for presenting it, yet at the same time a novel which would reflect a milieu of immediate interest to the students. We chose

Warren Miller's The Cool World for a number of reasons:

1. The author of the eventual unit growing out of this book, Jonathan Kozol, had used it successfully with students of high-school age at the Urban School in Boston, and we therefore had some empirical evidence of student interest. This precluded the possibility of our choosing a novel in which we felt students *should* or *would* be interested, only to discover that our expectations had been based on mistaken judgment.
2. The Cool World was short; its idiom, while not extraordinarily difficult, represented an honest attempt to employ language consistent with the natures of the characters. This in turn opened up the area of narrative point of view, a fundamental concern for anyone interested in critical approaches to literature, as these students would have to be in college. The action of the novel, while not reflecting the personal experience of the majority of the students, nevertheless dramatizes an experience that is intellectually available to them, that draws them on instead of alienating them.
3. The issues explored -- love, sex, violence, ambition, power urges, moral weakness, desire for education, the limitations which poverty imposes on human aspirations -- were sufficiently universal so that in spite of explicit setting in New York's Harlem, students, properly encouraged, could discuss them within the context of their own lives.

> Moreover, the age of the characters was sufficiently close to that of the students to permit them to identify with the characters without necessarily seeing in them mirror images of themselves. The theory behind all this of course is that students unaccustomed to reading will be more responsive to works with whose content they can easily identify. Students who sympathize with the subject of a novel will be more inclined to enjoy the reading experience, and this pleasure is a requisite basis for a more informed and informative investigation of the more complex features of the art of fiction.

The completed unit was distributed to the six Upward Bound centers in the fall of 1966, for use in the Saturday programs. We considered this an initial testing, since the feedback we receive from teachers provide us with the information necessary in the process of revision. Such feedback tells us not only about the virtue and limitations of the unit, but the problems teachers encountered in presenting it. For example, one teacher reported as follows:

> "The most rewarding and surprising results came from the unit on The Cool World. After having read the book, I was reluctant to use the unit but decided to experiment with it after no one else dared to. The students were given the book on the Saturday preceding the Christmas holidays with the comment, "If you like it, read it; if not interested, don't bother to finish it." (This in itself is a startling statement to come from a teacher, and if the unit achieved nothing else, it encouraged this shift

in attitude from the conventional to the unconventional.)

"Results (the teacher continues in her report): (1) All students read the book. (2) Sisters and brothers of two of the students read it. (3) Two male students discussed it over the telephone. (4) None found the language offensive or shocking (as did the teacher): just normal for the environment, but all agreed that the sentence structure was not realistic. They felt that a fourteen year old no matter how deprived would not use phrases omitting the auxiliary verb such as:

'I goin down the street.'

'It a shame to God'

'Man, I tellin you'

or phrases such as this: 'I don't want have anything further to do with this boy.'... All pupils thought the author had to be a white man who did not know the people of Harlem. Many students suggested rereading the book during the following week for a continuance of the discussion the next week. The teacher was amazed and pleased with the sophistication and insight revealed in the more detailed analysis the following Saturday."

If one of the aims of these units is to reorient the teacher in her thinking about her students, their interests and their abilities, then this unit was eminently successful. If another is to motivate students to read, and to discuss their reading intelligently, then it was doubly successful, according to this report. We have not yet received specific details about the discussion on the second Saturday, but its "sophistication and insight" as described by the teacher are a promising indication of the quality of class response.

The Cool World unit was also designed to motivate student writing. One question in particular -- "What happened to Lu Ann? (a young girl who simply disappears without explanation during a visit to Coney Island near the end of the novel) -- provoked student interest, and one teacher had a clever idea -- which will be incorporated into the revised version of the unit -- of asking students to discuss the question imitating the style of the novel. The results were revealing: since students did not have to worry about "correct" style in their writing, they could focus on what they wanted to say, and came up with a variety of imaginative solutions, employing the style of the author. One of the most interesting immediately follows this section, Preparation and Development of a Unit. Encouraging students to write "ungrammatically" might seem a dubious venture to some teachers, but the above mentioned piece of student writing reveals a very sensitive insight into the tone, rhythm, and idiom of the original author, Warren Miller; the student who wrote it obviously enjoyed what he was writing, and was not blocked by the usual obstacles which inhibit student writing. Perhaps one way of approaching the problem of student writing is to encourage them to imitate someone else's "voice" or "style"; the question of developing their own "voice" or "style" can come later.

A final word on this unit: I've tried to indicate above how it has influenced students and teachers; the response to it has also influenced the thinking of those of us who are involved in the continuous process of curriculum innovation and development. Reports from teachers give us an insight into the students' minds which we can employ in preparing future material, and in revising older units. The evaluation below from another center teacher, is an explicit example of the kind of commentary which enables us to improve units by building into their revisions the issues which emerge from discussions using the original versions. Students have been particularly interested in the dreams of Duke (the protagonist), and it is clear now that material should be added to enable teachers to explore the problem of dream as revelation of character in fiction, and indeed the relationship of dreams to the experience of reality.

EVALUATION OF THE COOL WORLD UNIT

The Cool World Unit was a most exciting one for the students and the teacher. With the exception of the units taught this past summer on identity and civil disobedience ("Who Am I" and "Hero in Jail"), The Cool World was the most successful unit I have taught. It pulled from the students sincere, intense, and involved response.

The success of the unit can be attributed to a number of factors, most obvious of which is the students' identification with the protagonist of the novel. Less obvious, but equally effective, is the flowing aspect of the novel itself: it moves fast and the students move unconsciously with it, finding themselves engrossed in Duke's world and Duke's mind.

Class discussion of the unit focused attention on many issues, as the unit is rich with interesting topics: Language and the effectiveness of Duke's speech; problems of an adolescent growing up in a ghetto; the Moynihan Report and the truth and falseness of it in regard to The Cool World; adolescent values, dreams, and outlooks on life; the relationship between one's morality (?) and one's living conditions; and, finally, the revelatory nature of dreams - or a discussion of psychoanalysis.

The students' involvement in all the discussions was unquestionably intense, and, consequently, I am unable to say which topic of those listed above was most successful; all were interesting enough and broad enough to be continued until -------. However, that discussion which made for a change in the students' attitude was the one dealing with the relationship between one's morals and one's living conditions, with the error of judging one's morals (?) in a vacuum. I stress this point because there was a struggle within the students as to their reaction to Duke's mother. At the beginning of our discussion, many of them dismissed her as something not fit for existence. As they explored the issue, looking closely at the novel itself, they concluded that she was as affected by the "cool world" as was Duke. In fact -- and this is encouraging to note -- the students said that the novel was less about the Duke and more about the Cool World and everyone caught in the "ugliness" of it.

The topic that led the students into completely unfamiliar horizons was that dealing with Duke's dreams. They could see that the dreams were important, but could not at first explain the dreams, that is, what they were revealing about the real Duke not being so cool. This question in their minds sowed the ground for the Freud-Jung unit.

I strongly recommend the unit as one that, like "To Kill a Mandarin", introduces the students to the experience of expressing themselves on issues that are relevant to their lives and to life in general. I recommend it also as a unit, again like "To Kill a Mandarin", that has innumerable follow-up possibilities.

The editorial committee has met a number of times to access the various forms of feedback analyzed above, and to decide on the changes to be incorporated in the revised version of The Cool World unit. The unit itself is presently undergoing final revision, and when these are completed, the unit will be reprinted in pamphlet form for wider distribution to Centers and schools expressing interest in such material.

The following is a student's deliberate attempt to imitate the style and language of Warren Miller's The Cool World, with all the author's consciously ungrammatical expressions.

What Happen to Lu Ann

We at Coney and riden in some of the rides. But Lu Ann she not much interested in them so we get some hot dogs and sit on a bench. After a while I need to find some toilets so I tell her to wait there til I get back. She don't say nothing but just keep looking out at the ocean. I say to her again wait there til I get back. She look up then and nod her head and start staring at the ocean again.

So I start looking for some toilets. I couldn't find none at first but I ask a guy who look like some of damn feak and he pointed the direction it was in. In bout fifty minutes I get back to the bench but Lu Ann not there.

I thought maybe she might be at the beach standin there in the water lookin at the ocean. So after waiting at the bench a long time I go to the beach. I look all around for her but I don't see her. I yell Lu Ann and start callin her name but she don't answer. After I couldn't find her I start asking people around the beach if they seen ~~her~~ a girl bout fifeteen wearin a black skirt and red shirt and carrying a big teddy bear. I all say they ain't seen her. So I start lookin all up the boardwalk and the dark house and all around the place. Then I went back to the beach and saw a guy who look like he been sitin there all day and I ask him if he seen a girl about fifeteen carring a teddy bear. He said he seen a couple of people that fit dat description. He put his head in his hand like he was thinking then and I wait for him to say something. After a long time and he don't say nothing I start to walk away. Then he yell out and say oh I think I know who you might be takin bout. She a skinny gal.

"Yeh" I say. "And she got freckles too."

"Well I don't know bout dat" he say "but I saw a skinny gal standin in the water just starin at it. She just stood there for a long time. Then she start walkin in the deep part wif all her cloths on. Everybody look at her at first but after a while they don't pay no tention to her. I keep my eye on her though."

"what happen then" I say.

"Im gitten ready to tell you boy. Juss keep yo shirt on." Well she start walkin deeper in the water. And after a while I don't see her no moe. She just disappear in the water."

I leave him then. I think to myself she always been crazy but to pull a stunt like that. I couldn't get over it and think now she don't never have to leave the ocean.

This is an excellent
continuation of the rhythms
and expressions found
in the book –

your ending is touching
and subtle –

SUPPLEMENT 1

Draft of Statement About Teaching

I. WHAT DO WE MEAN BY EFFECTIVE TEACHING?

In the approach we recommend, a teacher presents the students with something that is familiar or tangible, or both; explicitly or implicitly poses provocative questions about it; and then, by means of the students' responses, guides them toward an understanding of the unfamiliar or intangible, or both. The teacher using this approach has as his aim that the students experience the necessary learning process of themselves, and therefore is concerned with the end result only as it follows from this process.

Thus he has respect for student ideas and attitudes, and does not emphasize the "rightness" or "wrongness" of student replies (except in obvious factual matters, where glaring mistakes should be set right). If successful, this approach will encourage student involvement to continue beyond the classroom situation; it will stimulate students to do independent work; and it will help them to develop confidence in their own ideas, and to feel that they are worthwhile.

Consistent with this approach, our program has no predetermined body of subject matter to cover, no artificial rewards and punishments (e.g., tests and grades), and no imposition of knowledge through extensive lecturing. This does not mean, however, that we avoid traditional matters, or cannot give homework when it seems desirable and feasible, or preclude the teacher's active participation in class discussion. Homework, for example, should not be considered a routine assignment. Required reading for a unit, however, can be done outside of class -- especially when the introduction to the unit has already aroused interest in the book. To spend an entire period in silent reading, merely for the sake of avoiding "assignments" is not effective teaching.

II. WHAT SHOULD BE THE RELATION BETWEEN THE TEACHER AND THE UNIT?

Since there is a variety of units to choose from, the teacher should not feel compelled to use any whose subject or material is not congenial to him. However, by the same token, and since this is a curriculum-development program, he is expected to base his teaching on our units. Ideas for new units, or for further development of present units, may develop out of experience with these materials, and should this occur, we request that these ideas be communicated to us for possible inclusion in the program.

Each unit has a suggested teaching procedure built into it, often incorporating suggested alternatives. How closely the teacher adheres to this procedure will depend upon the purpose of the unit and the response of the class. There can be more flexibility in open-ended units (e.g., To Kill a Mandarin) than in those having a specific direction (e.g., The Sol-Terrella). And in these latter, there can be more flexibility regarding procedures than ends -- the initial teaching device, for example, may be replaced by another which the teacher may feel will be more successful (but concern over devices should not be taken as an end in itself, and that which they point to should always be kept in mind).

However, we strongly recommend that teachers new to the program, when teaching a unit for the first time, follow it substantially as written. One or two readings of a unit before teaching it is not adequate preparation. The teacher should study the unit carefully, familiarize himself with its goals and materials and procedures, should try to anticipate possible side issues raised by the unit, and be prepared (and feel free) to discuss them. But side issues should not dominate the unit, especially one having a specific direction, unless the teacher finds that they can be the most meaningful approach to the unit.

III. WHAT IS THE MOST MEANINGFUL CLASSROOM SITUATION?

The experimental nature of this program encourages an atmosphere of open interchange between teachers and students, teachers and teachers, and teachers and curriculum consultants. The classroom door should always be left open, figuratively if not literally, and the teacher should not feel threatened by frequent visits from those who have a common concern for improving the program.

As far as the conduct of the class itself is concerned, the teacher should strive to occupy the middle ground between lecturing at the students and letting them wander aimlessly about. Even in the open-ended unit, where the teacher has no particular point toward which to lead the class, he should call attention to relevant examples, problems, and distinctions as they come up, and should ask students to give reasons for their opinions, and so on.

The effective teacher is resourceful, imaginative, accepting, open, and able to unify the many divergent contributions of the class, but at the same time he is aware of when the trend of discussion has ceased leading to the goals of the unit. He should, however, be willing to examine and follow the students' own means for getting to these goals. When and if the learning process reaches the point where students want to know the "right" and "wrong" answers, he can deflect their anxiety -- not by saying he doesn't know or can't say -- but by asking them how they think one can tell "right" from "wrong".

In this way, they will be concerned with the criteria for evaluation and not just with the results, but at the same time will be able to discuss judgments.

Furthermore, although the teacher must avoid the appearance of being an arbitrary authority, he should give his own opinions if and when they are needed or wanted -- especially after he has won the students' confidence, and has convinced them that they need not follow his lead in everything. It is certainly not appropriate to subordinate everything else to a private hobby horse, or to keep bringing up controversial topics (such as Civil Rights, for example) when students would rather talk about something else for a change, or to reduce complex questions to a simple obsessive formula. But if the teacher is willing to make it clear that his opinions are human formulations rather than absolute truths, and that they derive from certain reasonings and assumptions that he is willing to expose to common scrutiny, then he would be remiss not to give them when they are called for. A teacher in the classroom is not a scientist conducting an experiment; he is a human being among other human beings, and the experimental reality of this situation is as important a part of the educational process as are the units and books. The most difficult job of all is to show students that an open mind is not necessarily empty of values, and that a committed mind is not necessarily closed to reality. But that is the job which is most worth doing.

SUPPLEMENT 2

Excerpts from Travelers' Reports

Summer 1966

....Further, the math units are not so difficult and do not require a Ph.D in mathematics to teach. This I said for the benefit of math and science people. They asked about some specific units. I tried to explain what was involved and intended in each of the units in question. I also agreed to demonstrate any of the units that they had in mind.

Further, it was made clear to all teachers that the central office was very much interested in any ideas for units that they may have. They could write their ideas up or give them to me or any other consultant and we could bring the ideas back.

That afternoon I went to a physics workshop conducted by R.... R... had a container of water along with some salt and sugar. The students found out what happens to a pencil in the water if you put salt or sugar. They also explored what happens if you punch holes in a can of water at different levels. All of this was done with R... saying very little. At times the discussion shifted to other related topics.

Something quite nice happened to me the next morning. I was looking for Mr. W...'s class when I accidentally walked into Mr. H...'s class. The kids were working with paper slide rules (they also had real slide rules).

As soon as I walked in, one of the student's said, "Hi, who are you?" I said, "You don't know do you." They told me that they had made adding machines. I said, "I don't believe you." They proceeded to show me. I started giving them harder problems. Before the period was over, we were doing interesting problems on the real slide rule. Problems like 35 x 37, $\sqrt{5}$, $\sqrt{2}$, $\sqrt{3}$, $\sqrt{125}$, $\sqrt{147}$, $\sqrt{61}$, $\sqrt{3700}$, etc. We got into a nice discussion about approximation to square roots.

Mr. H... was sitting over in the corner. At one point he left to get another teacher to watch what we were doing. I apologized to Mr. H... for taking over, but this was so spontaneous, we both felt it was nice that it happened. . . .

Jack Alexander

.... Many of the new English teachers had just begun to use our units, after having been encouraged by consultants and the swing teachers. One teacher found, to his surprise, that he was successful with the Van Gogh with a new group of students after having failed with his own material. In another instance a teacher, though not using our stuff, had skillfully incorporated some of the techniques suggested in our units with what he was presenting. On the whole, I got the feeling that only about 4 out of 10 of the teachers (this does not include the swing teachers) felt comfortable with our materials, and that at least two of them at this point still felt a little uncomfortable with our students, as evidenced by an overly solicitous attitude on the one hand and a timidity on the other....

.... I visited two of Mrs. C...'s classes and demonstrated in the latter. The students were reading "A Game of Catch" from the Who Am I unit and Mrs. C... had them acting out parts. I did the Chamber Theatre Technique with the second class to indicate to her the effectiveness of allowing students to direct their own scenes and to pay closer attention to the style of writing. The students were very responsive, and Mrs. C... was appreciative of the suggestions. Her greatest problem, which she readily acknowledged, was in keeping quiet after asking a question, so that students had time to think. She is quite tuned in to our philosophy, perhaps so because she is a high school teacher who has felt the need for a change for a long time. She is thrilled with being in the program and hopes to continue this fall....

Carolyn Fitchett

ANNOTATED LIST OF ENGLISH AND MATHEMATICS UNITS

Annotated List of English Materials
Prepared During the Writing Conference

Summer 1966

COLOR ME HAPPY: COLOR IMAGERY IN LITERATURE William T. Brown

Discussion of the varying emotions elicited by the same picture presented in black-and-white and in various color tones introduces students to literal and symbolic use of color as a means of expression and a source of significant and vivid imagery in poetry, drama, and fiction. Literary excerpts are studied to determine how color creates a setting, portrays an emotion, or contributes to the mood of an entire work. The writing assignments ask students to create their own descriptive passages using color as a form of imagery.

VOICES IN THE ARTS Mason I. Lowance, Jr.

The intent of this unit is to show, through comparison, that a mood or feeling may be generated by words in much the same way that it is by music. Beginning with renditions of varied musical styles -- from jazz to classical -- students discuss the feelings evoked by musical sounds. They then proceed to an examination of language, applying the principles of analysis they have acquired through examining the musical works.

ON THE COOL WORLD Jonathan Kozol

This unit focuses on a short and exciting novel of high interest to many teen-agers. The various elements at work in the novel -- the voice of the narrator, the development of characters and of plot, the use of language -- are analyzed in selected passages. The suggested writing assignment encourages students to examine closely an incident in the novel, and create and write -- in language and style of the story -- their own resolutions of the situation.

CHOICE, FATE AND OEDIPUS THE KING Arthur P. Davis

The effects of choice and fate in Sophocles' Oedipus Rex is studied in terms of the changes in Oedipus' personality as the drama unfolds. The unit begins with an open, unstructured discussion of the contradiction between the way we feel about fate -- through projecting the responses of a man who misses a plane that subsequently crashes, and admissions of semi-superstitiousness with respect to horoscopes and the like -- and how we think about it.

intellectually, tacitly assuming that we are "masters of our fates." As students begin reading Oedipus Rex, they are asked to chart the series of seemingly disassociated events in the play (or mentioned in the play), noting how each does or does not alter the personality of Oedipus.

TRUTH VS. FICTION

Revised by Robert Solem

The purpose of this unit is to examine the ways in which a writer of fiction creates in his readers a sense of involvement in a story and an emotional response to its characters. This purpose has been made more clear-cut and accessible to students through revision and inclusion of more revealing excerpts. The class considers whether "truth" and "fiction" -- in the sense that one deals with a world of fact, and the other with a world of imagination -- are necessarily polar opposites, and explores the techniques used in writing fiction and fact.

POETIC STRUCTURE

Norman Friedman

This first unit in a series of five on poetry focuses on poetic structure, specifically, dramatic structure. Students first enact situations from their own experiences, then certain situations suggested in the unit; later, they examine these situations as they are presented in particular poems, comparing their own spontaneous versions with the more selective and "completed" versions of the poets. The purpose is to encourage students to discover that the structure of a poem is not a random affair, but rather the results of a series of purposeful choices. Students examine deliberately altered versions of one poem -- Langston Hughes' "Late Last Night" -- in order to appreciate better the poet's reasons for choosing the final form of the poem.

POETIC TECHNIQUE

Norman Friedman

The concept of order -- point of view, selection, arrangement of details -- is the focus of the second unit in the poetry series. A number of possible choices in points of view, selection, and arrangements are defined and discussed, and the appendices include examples in poems illustrating each choice. The unit explores concretely the impact of a poem of the various choices open to a poet through additional altered versions of "Late Last Night," and representative "completed " poems by other poets.

POETIC STYLE

Norman Friedman

Attention, in this unit, is centered on poetic language: diction, figures of speech, rhythm, and sound. Again, altered versions of "Late Last Night" are used, this time to illustrate both levels of diction and types of figures of speech, emphasizing the effects of such language. Metaphor, for example, is discussed first in terms of how magazine advertisements "sell" a product by means of implication and association. Rhythm patterns are introduced by way of the patterns of various dance steps, and rhyme is discussed in terms of the appeal of both regularity and irregularity in our environment. As in the preceding units, additional poems are appended for further study, and students are given a chance to write or rewrite poems of their own, illustrating the different principles of style discussed in this unit.

NON-DRAMATIC STRUCTURES IN POETRY

Norman Friedman

In this fourth unit in the poetry series, attention is shifted from lyric poems whose structure is based on the reaction of a character to a situation, to the body of lyric poems which is a poetry of statement alone. Through discussion and dramatization of suggested propositions, students derive functional definitions of non-dramatic structures in poetry, and through close analysis of selected poems, they discover characteristic techniques which distinguish this body of poetry from the reaction-to-situation poems they studied earlier in the series.

POETRY AS VISION

Norman Friedman

The final unit in the poetry series is devoted to the relationship among poetry, morality, and reality. The purpose of the unit is to show that it is the function of poetry, in one of its aspects -- in relation to the reader's life in society -- to broaden and deepen our awareness of the possibilities of life as a multi-faceted and ultimately undefinable phenomenon. The method recommended for making students aware of the relationship between poetry and reality follows three stages throughout the unit: to have students set up miniature debating teams in the classroom, to have the class discuss the results of these debates, and then to have them study a poem or group of poems dealing with the same issue.

WRITING A BOOK FOR CHILDREN

Jonathan Kozol

Based on the assumption that students might do for their younger sisters and brothers what they would not do for themselves, this unit involves the class' discussing specifically how they would draw up a book for children, a book for here and now, with local expressions, fads, place names, and familiar situations. Most important, the book would be designed to give a picture of life as students know it: if it were up to them to "educate" their brothers and sisters about "real life," what sort of things would they want to tell them, warn them about; what sorts of things, if any, would they want to protect them from, hide from them at this point in their lives. This unit also serves as an outline for a project started in class and carried through -- after class hours by those interested -- until a booklet is drawn up, complete with local pictures or illustrations.

AN HISTORICAL LOOK AT ENGLISH

Sandra Pearson

This unit is concerned with the evolution of language and demonstrates how English has changed through close comparison of four different versions of the Lord's Prayer: an Old English version, a Middle English version (Wycliffe's translation of the Bible), and Elizabethan version (The King James Version), and a modern version (The Revised Standard Version). Supplements to the unit include reproductions of the older versions and recordings of them, to demonstrate both the visual and oral changes, as well as a recording of a contemporary jazz-Mass version.

JABBERWOCKY: LITERATURE AND EXPERIMENTAL LANGUAGE

A. P. Davis

Beginning with a discussion of Lewis Carroll's "Jabberwocky," students examine the various ways in which writers have tried to convey a sense of reality using unconventional language, style, and form. Ultimately, students consider passages from Faulkner and Joyce and try to decide whether the experience certain modern writers are attempting to render requires the kind of experimental techniques adopted by these writers, and if so, what the relationship is between what they say and how they say it.

"WHERE DO I COME FROM? WHAT AM I? WHERE AM I GOING?" A unit in Autobiography

Jonathan Kozol

In this unit on writing autobiography, students are propelled into consideration of the basic questions of identification through close examination and discussion of Gauguin's painting "D'ou Venons-Nous? Que Sommes-Nous? Ou Allons-Nous?" (Where are we from? What are we? Where are we going?). Students afterwards describe graphically, or literally draw the equivalent, of their own physical and spiritual neighborhood, discussing the reasons for including certain details and omitting others, and finally writing a series of frank and personal responses to the questions raised in Gauguin's painting.

ON THE USES AND ABUSES OF POWER

Mary Wilburn

Designed to encourage students to discuss and think about the meaning of freedom, license, and limitation in any society, this unit has students enact Kenneth Brown's play The Brig on the theory that participating in the roles will provide them with a more vivid sense of the extreme use of power to restrict freedom. Students then read a passage from Rabelais which describes what might be considered a Utopia of License, whose motto is "Do what you wish." In the ensuing discussions, students are encouraged to compare the two extremes, and their effort on the humanity of the individual.

ANIMAL FABLE AND ORWELL'S ANIMAL FARM

Robert Solem

This unit explores the technique of investing animals with human characteristics and vice versa as a vehicle for commenting on the limitations and aspirations of men. Fables from Aesop and James Thurber, and Animal Farm by George Orwell are used to illustrate some of the ways the artist can use animal characters to reveal aspects of human behavior.

CONCENTRATION CAMP AND THE IDEA OF FREEDOM

Jonathan Kozol

The concept of freedom is investigated through a comparison of two classic books on confinement: Elie Wiesel's Night, on a Nazi concentration camp, and Alexander Solzhenitsyn's One Day in the Life of Ivan Denisovich, on a Russian prison camp. Specifically, students contrast the two books for their respective statements about freedom, the effects of confinement, and the spiritual triumph over -- or defeat under -- physical imprisonment.

EXPANDING THE IMAGINATION: AN ACTION APPROACH TO WRITING

Ann Flagg

The purpose of this unit is to provide students with an experiential approach to writing. This approach incorporates pantomime exercises, use of the tape recorder, and selected excerpts from various authors as devices for fostering the sorts of experiences that may result in students' writing with greater ease and effectiveness as well as reading with greater understanding and pleasure. Through pantomime, students are encouraged to stretch their imaginations and to invent and express a variety of ideas on a non-verbal level, as preparation for the writing and reading they will do later in the unit. The reading, writing, and pantomiming reinforce each other in impressing upon students the value of precise words and keen observation of detail in communciating thoughts.

ON THE CREATION OF POETRY

Robert Solem

By actually "re-constructing" a poem, students gain some insight into the relationships between the words or "raw material" of a poem and its structure and subject matter. Later, by comparing their efforts with the original and by discussing the differences between them, students gain a better understanding of the nature of poetry.

Langston Hughes' "Homecoming" is used as the model for reconstruction: its vocabulary is simple and colloquial, and the protagonist's situation and mood can be readily understood by students, and there is ample substance in the poem for worthwhile discussion.

A WRITING UNIT USING THE THEME OF DISGUISE

Roberta Rabinoff

Since many students have a need for assistance in expository writing, this unit is designed to help them in arriving at a thesis based on a given amount of material. The use of masks and disguises in modern society is the theme in the literary excerpts students examine and in their subsequent writing. The unit illustrates that selected details or items may suggest a number of generalizations, depending upon the point of view of the writer.

THE NATURE AND MEANING OF VIOLENCE

Jonathan Kozol

Violence as both a theme in literature and a part of the human condition is the focus of this unit, and discussion of the theme ranges from ethical justification to realistic assessment of our inner attitudes toward violence. Fictional and historical expressions of violence are explored through such literary works as Hemingway's "The Killers," Hersey's Hiroshima, and Shakespeare's King Lear, and through newspaper accounts of the execution of the Rosenbergs.

MAN VERSUS MACHINE

Robert Solem

In creating the machine, has man sown the seeds of his own destruction? The relationship between man and machine, the impact of technology upon society, and man's recurring anxiety that he may someday lose control of the machines he has built are examined in terms of the 20th century social and personal advantages and disadvantages of the "age of the computer," and a 19th century satire on the conditions and practices of Western Civilization, Erewhon by Samuel Butler.

ENGLISH UNIT IDEAS INITIATED DURING TEACHERS' WORKSHOP

The Sacred Calves	Mary Walker
Tales of Gods and Heros	Mary Walker
Form for Fun	Doris Adler
Form as Code	Doris Adler
The Faces of Silence	Cleo Gray
On Brecht's The Good Woman of Setzuan	Burton Melnick
Sifting Sands: A Unit on Status-Seeking	John Williams
The Aphorism: A Unit on Student Writing	Mason I. Lowance, Jr.
Real Estate and Imagined Estate: A Unit on Writing	Mason I. Lowance, Jr.
A Game of Password	Carol Reed
Experiencing with Drama	John Williams
Non-Realistic Fiction	Burton Melnick

An Annotated List of Mathematics and Science Units Produced at the Writing Conference

Summer 1966

MATHEMATICS UNITS

A Chain Loop Puzzle — Irving Adler

Using a chain of paper strips joined by paper fasteners, this unit considers the possibilities for forming triangles. The question posed, for a given loop of these strips, is how many different triangles can be formed. The investigation moves from empirical to analytic to abstract modes of looking at the problem.

Additions to Polygons and Symmetries — David Seligson

After looking at symmetries of two-dimensional figures and discovering the need for a place of reference, students are able to describe symmetry of three-dimensional figures. This unit encourages the students to observe all forms of symmetry -- in blocks, pyramids and even in nature.

A Problem About Divisibility — Irving Adler

This encourages independent and joint activity, problem-solving skills, and mathematical knowledge and skill. Students set up mathematical problems and solve them in a logical process -- defining terms (such as modulo and congruence) as they go. Some advanced mathematics is presented in a clear, interesting and meaningful way.

Classroom Use of Tic-Tac-Toe — Newcomb Greenleaf

Game-playing appeals to students, and Tic-Tac-Toe is such a familiar game that this unit can get off to a roaring start and move along very quickly. Game strategy is studied -- how to win, how to draw, and "what happens if . . ." Extensions and variations of the game are considered including changing the size of the board and the number of dimensions. Games in which one or more of the moves are made randomly are also analyzed and questions of probability are introduced.

I Doubt It

John Alexander

This unit is a card game in itself. The methods of winning are shared at the conclusion of the games and it becomes obvious that whatever methods the students employ to win will involve probability-type thinking.

Loonie Graphs

John Alexander

Plotting of points leads to outlines of well-known cartoon figures such as Charlie Brown. This leads to an analysis of equations associated with various lines in the cartoon figure.

Odds and Evens

Irving Adler

This unit gives the students an opportunity to make empirical observations, to observe regularities, to formulate conjectures, and to try to prove the conjectures. The mathematical concepts involved are probability, permutation, and the balance of odd and even integers under subtraction and multiplication.

Random Triangles

Newcomb Greenleaf

Some probability and geometry is presented and used as an introduction to inequalities and their graphs. A game serves as an introduction to the unit. The students discover interesting properties of triangles and go on to prove that certain figures are triangles. Other problems and games are introduced and data are recorded.

The Induction Game

Jack Alexander

Card-playing again stimulates group activity and the desire to win induces the players to discover the winning rule. One student forms the "rule", a not too difficult rule, and the other students are to guess what the rule is.

The Statistics of Dueling -- Some "Old Math"

William Nicholson

This short unit should give students some appreciation for mathematics done thousands of years ago. It is hoped that they will also see some of the motivation behind the ancients' acceptance of certain formulas. Further, students will be forced to do some analytical thinking.

BIOLOGY UNITS

ABO Blood Groups of Man

David Seligson

Many students have familiarity with the human red cell groups but lack an intuitive understanding of the underlying principles of blood grouping. Typically there have been units in which a drop of the student's blood has been tested against commercial antisera with the idea of finding out the student's type. The purpose of this unit then is to supply an appreciation for the fundamentals behind blood grouping.

Ages of Experimental Animals

Irving Adler

The purposes of this unit are to develop an appreciation of the fact that scientific problems frequently lead to mathematical problems, and then the solution of the scientific problem depends on the solution of the mathematical problem; that the solution of a mathematical problem is sometimes obtained by a process of trial and error; that students learn through the process to "discover" and solve a problem whose solution is simple and effective.

Camouflage Game -- Bugs and Birds

Jeff Camhi

The unit is a game. The players determine the stages of life of their birds and bugs "disks" by moving them on a board. The player with the largest population of living insects wins the game.

Cells and Physical Forces

John Rier

The aims of this unit are to show the variety of cell shapes in the body of a plant, to devise methods in the laboratory which may illustrate these shapes, and to construct models of the cellular organization found in plants. Students observe through a microscope the cellular shapes of Coleus and a bit of mashed tomato pulp.

Exploring Plant Cells

John Rier

This unit is designed to give students an opportunity to observe plant cells and tissue organization for similarities and differences in structure and composition. The teacher will simply make the suggested materials available for macroscopic examination and chemical tests. The students may design methods and procedures for examining the plant materials at the cellular level. There should result an appreciation for the careful work needed for understanding life at the cellular level.

Fick Principle David Seligson

This unit explores the techniques of measurement. By withdrawing and weighing a small number of objects from a large pool of objects students should be able to figure out the number of objects in the large pool. Several aspects of such a procedure can be discussed and extended into other problems.

Flies Jeff Camhi

This is a unit on the feeding behavior of flies. Students determine by experimentation whether a fly or a human being is more sensitive to the taste of sugar and then go on to test other tastes to which flies are sensitive.

Grass Jeff Camhi

In grass, the most common of plants, there is a whole complex world of structure. Only in an attempt to draw an actual grass blade does the student become aware of its detail and proportion. Several grass species can be discussed and investigated.

Coney Island Dave Pradell

This is a three-part unit designed for use in either a classroom or a lab. Part I is concerned with sampling large numbers, estimating, and becoming familiar with the use of exponents. In Part II, yeast, a fast growing population, is sampled under different environmental conditions. Part III covers two alternative methods of sampling populations indirectly.

Pollen John Rier

Hayfever, that age old sign of advancing spring, is caused often by pollen grains, immature male plants borne on the male parts of flowers or on staminate cones of trees in the Pine family. This unit is designed to show that pollen is an immature plant, to show variations in form, and to illustrate methods for the collection of pollen.

The Growth and Regulation of Populations Jeff Camhi

A hypothetical situation (originating sparrows on an island) is presented and through this simple situation students are able to predict rate of growth of the birds by naming conditions which aid or hinder survival and reproduction. Students can graph predictions and recognize probable outcomes thus regulating outcomes.

The Uptake of Water in Plants

John Rier

The coleus plant is once again the subject in this experiment. The unit aims to illustrate the phenomenon of water uptake in plants and to show a possible quantitative relationship between the structure and physiological activity and to provide an opportunity for a mathematical analysis of biological activity.

Weight Perception

David Seligson

The problem is to determine how well one can distinguish between different weights by estimating them with the hand. This unit is designed so that students discover for themselves Weber's Law, which states that no matter what the size of the objects considered, the percentage error of discrimination is a constant.

PHYSICAL SCIENCE UNITS

Gravity Units

Dane Morgan

This series of units includes topics entitled Balloons, Motion Graphs, Pendulums, Ramps, and What Do You Mean Level? The theme of the gravity units is to illustrate a way of moving the questioning process. All reasonable human beings are convinced that heavier objects fall faster than lighter objects and that an object dropped from a moving ship's mast hits the poop deck. These beliefs are founded in experience and cannot be discussed as sheer misconceptions. The units all begin with common situations which do not ignore air resistance and friction. The idealized view arises slowly and naturally from actual non-idealized events as the limiting case.

Balloons: The students are encouraged to predict the ratio of number of washers tied to a balloon to the rate of the fall of the balloon. They perform the actual experiments, graph the data and compare their prediction to the real result. More accurate predictions can be made when other hypothetical balloon problems are presented.

Motion Graphs: The study of motions is projected onto graph paper when students are encouraged to illustrate problems by drawing models and recording data. In this manner, the problem is more easily solvable and the workings are understandable.

Pendulums: The main purpose is to give experience in strong inference reasoning. Students compare and graph the behavior of balls rolling down ramps versus the swing of balls on pendulums.

Ramps: How things move on ramps of varying slopes and why is presented as a problem to be explained in theory. Several concrete problems are proposed and through solutions, students are able to discover the theory and express it.

What Do You Mean Level? This unit discusses the word "level" -- an every-day word that appeared with an important and complex background and history. The students learn how to determine what is a level object.

Sol-Terrella

Marvin Fridley

If one orients a globe out-of-doors in the proper manner and fixes it with respect to the earth, he will see the globe being illuminated in exactly the same fashion as the earth is at that moment in time. Upon closer inspection and thought, a surprising number of facts can be "read off" or inferred for that day anywhere in the world. Over a prolonged period of time, the shift of the shadow can be correlated with seasonal events. The unit serves two broad purposes; it asks the student to engage in scientific model making at a fairly unsophisticated level and to test his model through short and long range observations.

The Sun

Marvin Fridley

The main purpose of the unit shifts from the actual physical model of a reduced size to a more abstract form of model making: namely a pencil and paper representation that draws upon information that the students themselves observe and from reading and looking at data compiled by experts using sophisticated equipment.

The Moon

Marvin Fridley

This unit can be used as a sequel to the Sol-Terrella Unit, or with modification it can stand alone. While unsophisticated, model making at this level can be enlightening in spite of the amount of exposure to the facts about the moon the students may have had both in and out of school. Basically the unit asks the question, "Can we construct a model of the moon and once having done so, what can we learn about the moon from our model?"

Writings in Science

John Rier

This unit was designed to acquaint the student with materials written on certain events occurring in nature or in experiments, to provide an opportunity to examine scientific materals for style, and to create in the student a sense of responsibility to the reader when communicating information.

Math and Science Unit Ideas Initiated By Visiting Teachers at the Summer Writing Conference

Summer 1966

MATH UNITS

Variations on Crazy Dice	Will Riggan
Finite Differences: An Extension of Empirically Derived Functions	Sister John Elizabeth
Switches and Batteries into Set Theory	Sister John Elizabeth
Mirror Cards	Sister John Elizabeth
Set Theory	Sister John Elizabeth
Comments on Philosophy	Richard Gowell
The Illustration of Various Properties	Juanita Stiles
A Game Called Slope	Juanita Stiles
Not a Unit on the Illustration of Various Properties	Juanita Stiles
Suggestions for Math Units	Juanita Stiles
I Am A Simple Computer	Alice Hankla
More Hints for Euclidean Algebra	Alice Hankla
The Probability of Freedom	Richard Hatfield
Or ... And ... Maybe? A Journey into Doubt	Richard Hatfield
RUOF -- An Introduction To Systems of Numeration	Harold Tate
Topology and Networks	Virginia Merrill
Cryptography	Virginia Merrill
The Pivot Game	Gladys Richardson
Enrichment Units	Gladys Richardson

Proposal for Mathematics Workshop	Beverly Jacques
Statistics	John Ernst
Permutations and Combination Dance?	John Ernst
What is Topology?	Larry Rabinowtiz
Game of Pure Strategy	Colin E. Bell
From Clocks to Groups	Daniel Mosenkis

BIOLOGY UNITS

Beating Heart of the Earthworms	William Briggs
Diffusion	William Briggs
Suggestion for a Unit on Embryology	William Briggs
Extension of Diffusion	William Briggs

PHYSICAL SCIENCE UNITS

Radiation	Frances Jeter
Chemistry Workshop	Melvin Hodges
Chromotography	Riley Elliot
Measurement	Riley Elliot
Diffusion	Riley Elliot
Floating	John Ernst

EVALUATION

A formal evaluation study of the whole program is still in progress, begun under ESI direction, and now being continued by an independent group supported by the Office of Economic Opportunity.

The Curriculum Resources Group relies heavily on teachers and counselors at each of the centers to conduct their own informal evaluation of the progress of the students, and also to supply feedback on classroom experience. An example of teacher response in English has been included in the discussion of The Cool World in Section V. D. above (pages V-15-6). One of the more reflective mathematics teachers tells of the problems and rewards he encountered with the units in his classes during the summer:

> .... Basic, I think, to the use of ESI material is that it is designed not to be used as a text but to serve as a stimulus for ideas and directions on the part of both teacher and students. It is not simply gimmickry which, after the initial presentation, leaves the teacher to fall back on traditional concepts and approaches to those concepts. Theoretically, for example, "Crazy Dice" should result in different discoveries every time it is taught....
>
> It will be a long time before we can evaluate the program objectively and even that will always be frustratingly limited. However, my immediate post-operative reflections on the math program run like this:
>
> 1. I am almost convinced that the most valuable mathematics course for a summer session for students such as ours, some of whom have never known success in school math courses, is one whose primary goal is to teach people to use tools they already have in a creative fashion. This, of course, does not preclude the inclusion of new materials.
>
> 2. Most of the ESI Pre-College Math material serves as a most effective vehicle for this approach. By this, I mean absorption of the material on the part

of the teacher without using it as a text. Very often what happened in class referred only obliquely to the ESI units and I consistently changed their sequence.

3. One bad day (Monday, July 11) when nothing moved, drove home to me the unusual demands for creativity and alertness this material makes on a teacher. If for no other reason than that, I would not recommend any teacher's using this approach unless he or she is really philosophically committed to it....

TEACHER TRAINING AND DISSEMINATION OF INFORMATION CONCERNING MATERIALS PRODUCED

Teacher training and orientation sessions with demonstration classes are held at each of the centers before classes begin in order to acquaint teachers with the materials and techniques for using them effectively. In every case center directors were urged to invite teachers and administrators from neighboring schools and universities so that information about the program would spread. At one such session, students engaged in a discussion with some of the forty or fifty observers who had just watched a math class. One of the observers seemed to be convinced that the students in the program responded well because they were specially selected and that this way of teaching couldn't possibly work in a regular high school. The students took him on, defended the program, gave their interpretation of how the material was taught and why it worked for them, and ended by saying that they "didn't know anyone in their high school who couldn't profit and learn from a program like this." An account of this discussion between students and teachers is included at the end of this section.

The curriculum materials have an impact not only on students but also on teachers, and the orientation sessions are designed to involve teachers as much as possible in the process of innovation. The sessions usually begin with an evening of general discussion about the program, especially if there are new teachers present. The next day is devoted to demonstration classes, usually with consultants teaching two in math and two in English, and center teachers and other visitors observing. Each class is followed by discussion and analysis, with students, teachers and visitors joining in. In the late afternoon or the next morning the English and math groups meet separately to work on developing a unit -- either one that a center teacher has been thinking about or one that the CRG consultants have brought with them in rough form. Then, either one of the center teachers or one of the consultants tries the new unit with a class, and the whole group meets again to talk about how it went and how the unit might be improved. Excerpts from one report of orientation session are included at the end of this session.

The Curriculum Resources Group has the important task of improving its capabilities for training and orienting teachers who will use these materials and has increasing difficulty meeting the demand for demonstration classes. In an effort to meet this problem one of the participants during the summer of 1966 experimented with a synchronized slide-tape method of demonstrating teaching approaches with CRG materials. The method is inexpensive but not completely satisfactory. CRG is considering the feasibility of demonstration films and hopes to be able to investigate this approach during 1967-68.

SUPPLEMENT I

Discussion on Education Between Students and Teachers

The following discussion occurred at an Upward Bound center in December, 1966 after a demonstration class on Logic and Truth Tables using Attribute Blocks. There were between forty and fifty observers from schools in the area, and after the class the audience was asked if there were any questions or comments they would like to address to the students or teacher.

One observer said, "These kids seem pretty intelligent. They seem to enjoy what they have done. Isn't this group fixed?" The teacher didn't understand what he meant by that. He said, "Well, how were they chosen?" She said, "Well, this is John's section because I've already taught this to my section." That wasn't what he meant at all. He said, "No, I don't mean what section it is, I mean how were the kids chosen?" Finally, it was explained that these were the kids from the Upward Bound program -- they were just kids who had applied. He didn't say anything.

This led into some discussion about the program. One student said, "Well, it's more fun than reading out of a book and listening to a teacher." Another said, "It's more informal." And a third student said, "I liked this but I wouldn't advise it in a public school because you need to know the fundamentals.

Then the first questioner, whom I will call Observer A, came back and said, "Well, you know, I could teach a class like this too, but I would like to see you make word problems and algebra as charming as you make these truth tables." Nobody answered much to this. He went on to say, "Why are these students here?" and answered himself by saying, "Oh, they enrolled voluntarily." He thought that was very significant. Another student took him up on this and said, "Why are we here? We are here because we enjoy it here, we enjoy learning, we enjoy the freedom of the classes, we get to ask questions. In school, you get to ask questions, but the difference here is that you get to figure it out for yourself." Observer A came back and asked this particular boy, whose name was Leo, how many kids there were in his high school. Leo said there were about 3,000. And then A said, "How many of those kids were in this program?" And Leo said that he guessed there were about 20. The observer said, "Ah, 20 out of 3,000 from one high school. That is what you need for this to succeed -- students have to want to come. That's the thing."

Another person in the audience, who must have been a counselor, said, "Well, I helped choose the students who were coming to this program. I chose students I thought would come and participate; none of them are risks at all." This led a student to say, "Well, it was up to the Center to choose and accept, not up to the high school." Another student pointed out that more applied than were accepted. A third student said that there had been an assembly program in his school for all the juniors, so they all knew about it and could apply if they were interested. Observer A remarked that the students seemed to be picked for their desire to improve. This brought an interesting, indirect response from one of the students who said there were many more not accepted who also desired to improve. Observer A then asked, "If they didn't like the program, were they free to go home?" And the students said, "Oh yes, in fact, two had gone home at the beginning of the summer."

A new member of the audience spoke up and said, "I would like to see word problems presented this way too." This brought another student in who said, "Suppose you were going to do word problems on percent. The thing you want to do is to have a physical thing to talk about - the percentage of that thing - so you could really manipulate that particular object." Another student said, "Well, this program really isn't set up to prepare you for those specific things. It is much more to open you up. We all tended to be reticent and we didn't really express our ideas very well. The idea of this program was to open us up and to get us thinking and expressing our ideas."

A girl said, "Well, I'm in Algebra III and I can't factor and I never could. I'm not quite sure how I got into Algebra III but I just never could factor. And I think that you in the Upward Bound program should sit down with us some time, try to help us with these specific problems." A second student said, "Well, it would be hard to go back like that; you should have asked for the help back in Algebra I and II." Whereupon another student said, "In high school it's hard to get help." The second student said, "Well, some teachers don't want to give you time, and also, if they just teach by the book then they are not aware of the problems individual students have. They are in too much of a rush to sit down and help just one individual. They are just too busy and that is why some kids get discouraged and drop out." Another student said, "No, I don't agree. It is not always the teacher's fault. For instance, in my school, we have a math clinic at eight o'clock in the morning. People who are having trouble can come in at 8 a.m. and get help." The audience applauded. This kid then went on to say, "And to answer the lady in the back about word problems, we did work with them during the summer session." Another student said, "Well, in my school we have split session: you go to school at 6:55 in the morning and there are classes until 6:30 in the evening. The teachers really don't have time to help you."

The counselor who had made the comment about choosing and not choosing said that she was surprised to hear kids this bright say how hard it was to get help because her feeling was that it was just these bright articulate kids who could always get help. Someone asked, "Did she know these particular students or is she assuming that they are bright?" No, She is talking about having watched that class and seeing that they were obviously bright and articulate. One kid said, "Well, in high school, you can sit in the back of the room and just go to sleep. Some of the teachers are nice and some are not." This didn't seem to be apropos of anything in particular. Another student spoke up, "The lady said she wouldn't expect that kind of statement from bright kids -- that's the trouble -- the teachers cater to the bright kids." Whereupon another girl said, "No, I disagree with that, it is the bright kids who can really get it on their own." Another student said, "Well, if you are slow, you have to ask the teachers. You have to take the initiative and you have to get help on your own time."

A new member of the audience spoke up, "One of the troubles students have with math is that they don't see any use for it." He wondered if the students saw any use for the truth tables in the demonstration class. One girl said, no, she really didn't see any special use. She didn't think it was going to be any help, but it was still good to see that you could really figure something out for yourself. She said, "Sometimes there is too much emphasis on useful facts." Another kid spoke up and said, "Well, you know in school, we learned that Columbus discovered America, what use is that?" A third student said, "Well, you know, maybe the truth tables would help you see how you could use common sense." Another girl said, "One of the reasons it was so exciting to be involved in this kind of class and this kind of teaching was that it gave you something to look forward to. It gave you a goal in your regular high school. You know that if you got through your regular high school, you could look forward to exciting teaching like this."

Now our old antagonistic observer A came back and said, "These students have a spark, an inner something; they have hope. If you don't have this, such a program couldn't work. These are kids who are already turned on." I think he felt that we were saying implicitly that he ought to be doing these things in his class. This really threatened him and so he was hammering away at how these kids were special. "They have really got it and if they didn't have it, then they couldn't do this. In the regular high schools where we have all these kids, they don't come voluntarily, they are forced to come, and they don't have any of this drive. You couldn't expect anybody to do this kind of thing in a regular high school." So he made this comment about the students having a spark and an inner something -- they have hope, and if you don't have this such a program couldn't work.

Another observer -- a student-teacher -- asked, "Where is this spark? What is it? Where is its source? I think it is in everybody and it is up to the teacher to kindle it, to bring it to life."

A student said, "Some teachers really do make you want to do it. They really make you want to learn. They keep up your curiosity. You know, none of us use all the talents we have. A program like this really makes you think." Another voice spoke up and said, "You know, we all seem to be knocking the book and the regular class, but you know you have to take PSAT's and SAT's and you have to know something to take those tests."

Then our old observer A came back. He seemed to feel each time that he had asked a telling question which would emphasize the unique and special character of the program and then he would sit back and realize that he really hadn't made his point, so he'd come back and ask another question. Now he asked, "Do you know anyone in your three-thousand-person high school who would not learn and profit from this program?" And he asked it in such a way that you knew in his own mind he felt that most of these 3000 probably couldn't profit from this program, that only a special little group could. But all the students, almost in unison, shook their heads and said, "No, no" -- they didn't know anyone in their high schools who couldn't profit and learn from a program like this. He was driven against the wall, and so he said, "Every one may be born equal but by the time they are fourteen, because of their environment and what happened to them, some of them are really turned off and you can't do anything with them."

And that embarrassed the teacher so much that she said, "Well, I think it is time for lunch."

W. L. Barclay III

December, 1966

SUPPLEMENT 2

Excerpts from an Account of a Teacher Orientation

June 28-31, 1966

Since this was our first experience with Center with which we are not "officially" affiliated on an administrative level, I thought it might be worthwhile to keep on file some of the more relevant lessons learned from this session.... I am still firmly convinced that an orientation conducted by us has a subtle but important influence on all those associated with our material. Much of our material may not appear to be impressive in print (it was not, after all, designed primarily to be read, but to be taught); but at B... (as elsewhere) it achieved its aim of rousing student enthusiasm and participation, and unconsciously stimulating their interest in the "serious" matters that lie beneath and behind the "fun." At B... more than at our Centers (where some teachers are familiar with our program, and others who are not have at least heard about it from experienced teachers) -- at B... I felt that at first observers were dubious about where the units were "going." I suppose we are still fighting a conventional battle against those who expect a "signed, sealed, and delivered" or Q.E.D. feeling at the end of an English or math class. Repeatedly observers asked "What point were you trying to make?" Although I approve of the way the demonstration classes were taught at B..., maybe in future orientations for "non-Center" audiences we should choose our units very carefully so that the "point" or "goal" will be more apparent -- though of course there is no need to "get there" in one class. Alice's class on triangles at H... was a perfect example of this latter type of unit; absolutely no one was left wondering where she was going.

On the other hand, in discussion before and after class, we were able to articulate where such units might go, and in English at least I noticed that response to the second demonstration was less puzzled, there was less "resistance" (again, not because of the way either class was taught, simply a matter of greater familiarity) than after the first, because the audience had been oriented toward projecting future possibilities in their imagination, as it were. After the first math class, students walked out asking, "Why don't they do something like this in our regular classes?" -- which is "old hat" to us by now, but has its effect on the teachers and others in the audience.

The sequence of the orientation was as follows: after dinner Tuesday night, the B... Upward Bound Director arranged a collation (very spirited, in more ways than one) for general introductions and informal conversation. One of the most striking things emerging from these tasks was B... uncertainty resulting from their unfamiliarity with the kinds of students they were to have.... It was less than desirable to do our demonstration classes with students from B... High School, none of whom qualify for the Upward Bound Program. The Director of course had no choice -- it was these students or none; and although the response from students was excellent, this could always be written off to their "superior" education, background,etc. There is always a hidden "plus" to using such students, however; it proves that our material, ostensibly designed for economically "disadvantaged" students, can be a resounding success with students from any background or area, if well presented. Incidentally, I had never done a unit with anyone but seniors, but my students this time were sophomores and juniors -- there seemed to be no difference whatsoever, and one teacher in fact questioned each student concerning his class level, apparently to make sure no seniors had "sneaked in."...

To return to the sequence of the orientation: following the general social gathering and discussion Tuesday, Carolyn on Wednesday morning taught "An Approach to Style" and Jack did a math unit. This was followed by prolonged joint discussion of both classes, and it was remarkable how the guilt which troubles so many teachers emerged: What do you do if a student never speaks? Or if one student seems to dominate? One of the B... English teachers vehemently insisted that such students should be told to SHUT UP; and when asked if that were exactly the way he would put it to the students, he replied, "No, I would say 'We've heard enough from you, young man; let's let somebody else perform now.'" So he struck out twice. This discussion was even more valuable, I think, than the more general one of the evening before, because it forced the teachers to formulate and articulate their own educational philosophy, and to reflect more explicitly than I suspect they had done on how they would approach the Upward Bound experience. I think the consultants served as catalysts at B...; very quickly the discussion of the classes became a kind of class itself, in which teachers and others present directed themselves, as it were. The B... program assistants again got involved intimately in the exchanges, and it became even clearer that the fundamental differences between B... and W... points of view would not be easily reconciled.

Wednesday afternoon the English and math teachers met separately with respective consultants; and by now we had generated sufficient interest so that the teachers were motivated to ask some searching questions about the intention of various specific units. Again and again sophisticates tell us that what we are doing is obvious, that nothing really needs to be explained; yet one of the B... English teachers (guess who?) asked in the middle of our discussion what we thought of his idea of having students memorize four lines of poetry each night, "so that they could become intimately acquainted with literature." One would have thought that on the second day of orientation he might have been able to predict the answer to that question. One of the things repeated orientations have taught me is that although many and perhaps most of the teachers with whom we come in contact are interested, well-intentioned, and capable, they need some kind of spark, some statement of direction, some demonstration that the abilities as teachers which they possess can be used even more fruitfully than they are using them. In a way, our orientations encourage teachers to exploit their talents just as our classes encourage students to exploit theirs. If, as some sceptics argue, "good" teachers don't need this sort of orientation, why hasn't a good teacher like Mrs. D... (for example) been teaching this way all her life? Or, for that matter, why haven't I? The other B... English Teacher, a highly intelligent man, a member of the B... faculty, couldn't wait to try out some of our material in his regular college classes in the fall. In other words, B... confirmed once again the premise behind our orientation program: teachers must be shown, not merely told, and then permitted to discuss what they have seen.

Wednesday night I spoke "officially" to the whole group, and I confess that by this time I felt that anything I might say was superfluous, or had already been said. But apparently some ideas survive (and even warrant) repetition; in any case, questions from the audience were directed at the consultants, and this time teachers and others seemed as interested in looking at us as at themselves. It was evident to me that certain problems were raised in this discussion which the B... and W... people had not given sufficient thought to previously; and I have the feeling that much that was said this evening was taken away and permitted to germinate.

Thursday morning, English and math groups met separately to create or reconstruct a unit, and I personally feel that this was the most fruitful part of the orientation; or rather, let's say that together with the following demonstration class (of this unit), it was a dramatically successful climax to the three days. The day before, teachers had been worrying about the "point" or direction of a unit; I simply played my tape of a myth, and let the teachers decide where it could be taken. Our "favorite" B... English teacher (actually, he is not a member of the B... faculty, only of the Upward Bound staff) announced that he would begin writing on the board the words "shaman" and "taboo" (which appear in the myth) and define them for the class, "because," as he confidently declared, "no high school sophomore would know what they meant." I suggested that he was probably mistaken on two counts: first, that he underestimated the intelligence of these students, and second, that those who didn't know the meanings could easily guess from the context. He relented sufficiently to admit that someone might know that a shaman was like a witch-doctor, and I observed rather jestingly, if irreverently (the teacher was a Jesuit priest) that he'd better be careful, since someone might compare a shaman to a modern day priest. To our delight, when I played the myth to the class, the very first student who spoke used and clearly defined "taboo," and when a minute later another student mentioned shaman, I asked what a shaman was: "He's like a witch doctor," the student observed.

Then I maliciously asked--I couldn't help it--"And if you had to find a kind of modern-day equivalent to a shaman, what might you call him?" "A priest!" the student responded, without batting an eyelash, and, although others added "judge" and "doctor," I wasn't really listening; fortunately, the sceptic himself seemed to enjoy being proved wrong.

But during the morning creation of the unit, each teacher made differing suggestions about the possible direction; and nothing could have proved more clearly the flexibility of our material. Many of the possibilities suggested in the morning came up in the class; others did not; but the depth and intellectual potentiality of apparently simple material was dramatically demonstrated. The class consisted of high school students, as I mentioned; and the discussion, a very frank one (the Jesuit left in the middle, possibly because of the emphasis on atheism) focused on the relationship of myth to religion. After the class, students seemed reluctant to leave, so I thought it might be interesting to the teachers to hear from the students what they thought of the class and material; and it was. They agreed that this could never be done in their regular high schools, and after some pressing they suggested that with few exceptions their teachers were more like prison wardens. In addition they insisted that there were too many "goof-offs" in a regular class who would create chaos by clowning; and when I asked the student who said this whether he knew any goof-offs himself, he guffawed and announced: "Boy, I'm the biggest goof-off in the whole school. I get thrown out of class once a week." I sobered him by pointing out that he was one of the most valuable contributors in the class which had just ended, that he had been entirely serious about the discussion, that he had caused no trouble at all; and he was momentarily stuck. "Oh, but this was different," he finally said; and for him, obviously, it was.

But one girl came up the the question that always stumps me: "What happens," she asked, "when we go back to our regular classrooms? Of what value will this have been?" Similarly, many of the teachers wondered whether six or eight weeks or one or two summers in an Upward Bound program would give students sufficient strength or confidence to confront a "standard" college curriculum, much of which would be taught using traditional methods, and not oriented toward the student. Unless many colleges change, there is no completely satisfactory answer to this question; which is why we should not ignore Carolyn's idea of a new kind of 2-year college for "graduates" from Upward Bound Centers using our materials and approach; such students would have the transition to regular colleges eased for them (if they chose to go on), and enlightened colleges might be persuaded to give at least one year credit for this work. Students would thus "lose" one year, but this would be more than offset by their increased chances of meeting the challenge of college fruitfully and successfully.

After this class, one student asked how he could get into the program; and when told he didn't qualify, asked if he could come back afternoons or evenings to "sit in" on some of the workshop discussions. He left his name and address. A teacher asked the students whether they thought that our method could be used for teaching grammar, and one replied: "Sure; just write a sentence on the board and ask us where we thought it should be punctuated, and to tell why; and if we didn't all agree, we might discover that there's more than one way of punctuating a sentence." Which suggest that our message sometimes gets across even to the students who are used for demonstration purposes....

Lawrence Langer

July 7, 1966

MATERIALS DISTRIBUTION AND POSSIBLE FUTURE DIRECTIONS

A few English and mathematics units that have been tested and revised and edited have been printed in pamphlet form, and more will be done when funds and staff are available. Preliminary discussions have been held with publishers to discuss the possibilities for commercial publication and the response has been encouraging. Continued conversations are delayed until the Curriculum Resources Group's funding situation is clarified.

Originally, the writing conference was designed to continue to prepare material for six Upward Bound centers in the South. But by the time the summer arrived, we were also providing material (and in some cases, consultation and teacher orientation) to five additional ones (Tufts in Boston, Bowdoin in Maine, Wesleyan in Connecticut, Tougaloo in Mississippi and Prairie View in Texas), and gradually, the variety of schools using this material has increased. During the summer of 1966, for example, the editors of the program were asked to meet with the Curriculum and Development group at Harvard University (they have been invited to return in the summer of 1967) to discuss and demonstrate their materials before teachers from numerous school systems in and around Boston. Partly as a result of this meeting, CRG units were tried this past year in Concord-Carlisle High School in Concord, Massachusetts and Lewenberg Junior High School in Mattapan in the Boston urban area. Some CRG materials have also been used locally at the Driscoll Elementary School in Brookline, Rindge Technical High School in Cambridge, Commonwealth and Urban Schools in Boston, Parmenter Elementary School in Arlington and Watertown High School in Watertown. We have also sent units by special arrangement to the Opportunity High School in St. Louis and the Fulton County Board of Education in Atlanta. Moreover, we are providing several additional Upward Bound programs with curriculum material during the summer of 1967. These include Lane College in Tennessee, Luther College in Iowa, Clark and Paine Colleges in Georgia, Talladega College in Alabama, Cranbrook School in Michigan, Tougaloo in Mississippi, Prairie View in Texas, University of Virginia in Charlottesville, and the University of Massachusetts at Boston.

All this indicates two things: the widespread demand by schools all over the country for innovative curriculum which will be both _different_ from the usual material that obviously has had only a limited success with intellectually discouraged students, and _academically significant_ in a way that will motivate students to take an interest in learning and continue their educational career; and the dependence of these schools on an organization like the Curriculum Resources Group for guidance in revising their programs, their emphases, their attitudes, their materials. The ripple effect, from Upward Bound programs to bona fide school systems, has been confirmed again and again by the requests for advice and assistance which flow into this office, and it seems imperative now that a variety of curriculum groups be encouraged to continue their work, lest school systems which are today showing a greater and greater willingness to experiment, grow discouraged by lack of support and abandon their attempts. We have found the the task of curriculum innovation, when aimed at intellectually discouraged students, imposes almost insuperable burdens on teachers untrained in this direction; eventually, they may be able to handle it themselves, but at present most of their physical and intellectual energy must be diverted to the student and the classroom. Outside support is essential at this time for a source of fresh ideas and materials; such support helps able teachers make the adjustments necessary to face the task of providing a meaningful education to the intellectually discouraged student.

Up to now, we have been talking about innovative materials which serve as supplements to a regular high school classroom curriculum. But it has become evident that this creates perhaps as many problems as it solves, since students excited by new material lapse once more into indifference when confronted a day or a week later with familiar and uninteresting texts and pedagogical techniques. The most important need at this time, we feel, is sufficient staff, time, and funds to prepare an experimental curriculum in a variety of disciplines which would last a whole semester, and possibly an entire year, so that students would not have to make the difficult and really impossible adjustment from "old" to "new". Such a long-term curriculum would have to be not only sufficiently flexible so that neither teachers nor students would feel that an artifically rigid scheme had been imposed on them from without, but also sufficiently "structured" so that both teachers and students would derive a sense of accomplishment and of personal achievement, at the end of this educational experience. The next step would be to find some imaginative schools willing to substitute this term- or year-long experimental curriculum for their present one, perhaps using the present one in a control class and the new one in another, and evaluating the success of each at the end of a year. Of course, teacher training and orientation would be vital in a program of this sort, and indeed some sort of closely-knit working situation between teachers and curriculum developers, similar to the short-range one (described above) that obtained at the summer writing conference, would be highly desirable. The need for such a pilot program was suggested by one of the publishers who offered to help in its organization and support if he had the assurance that our program was a continuing one. The Curriculum Resources Group is at the moment working out the details of such a proposal, which is the natural culmination of our work thus far.

To Gladly Learn

An Account of the Program for Pre-College Centers

Dillard University *Howard University* *Texas Southern University*
Fisk University *Morehouse College* *Webster College*

Educational Services Incorporated

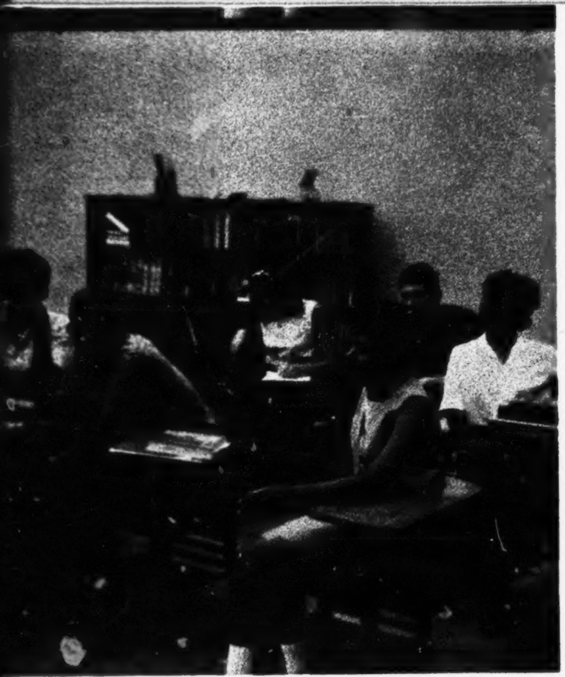
Preface

Herman Melville stated that to produce a mighty book, you must choose a mighty theme. If Melville was correct, then this slim pamphlet has fulfilled that requirement, for no mightier theme exists in our time than the one we have attempted to embody in these pages: the development of procedures for sympathetically unmasking the high qualities latent in young people, qualities which are often bypassed in the standard educational process.

The Pre-College Center Program has been in operation now for a year and I, for one, am greatly heartened by the entrancing sense of cohesion and solid harvest of accomplishments that have resulted. This pamphlet is a distillation of those things which we have found most effective in carrying out our tasks. In another sense, it is profoundly revelatory of the hard work and intense but healthy interaction which we have achieved in so short a time.

The traditional system of education too often reveals itself as the prime supporter of the Puritan myth that mirthless work is a virtue and enjoyment is consonant with guilt. In the Pre-College Program I believe that we are demonstrating not only that effective learning is the natural product of engrossing, relevant, and enjoyable study, but also that young people can seize upon the most abstruse themes with relish and understanding if the materials are presented with taste and in an atmosphere of concern.

HERMAN BRANSON
Director
Program for Pre-College Centers



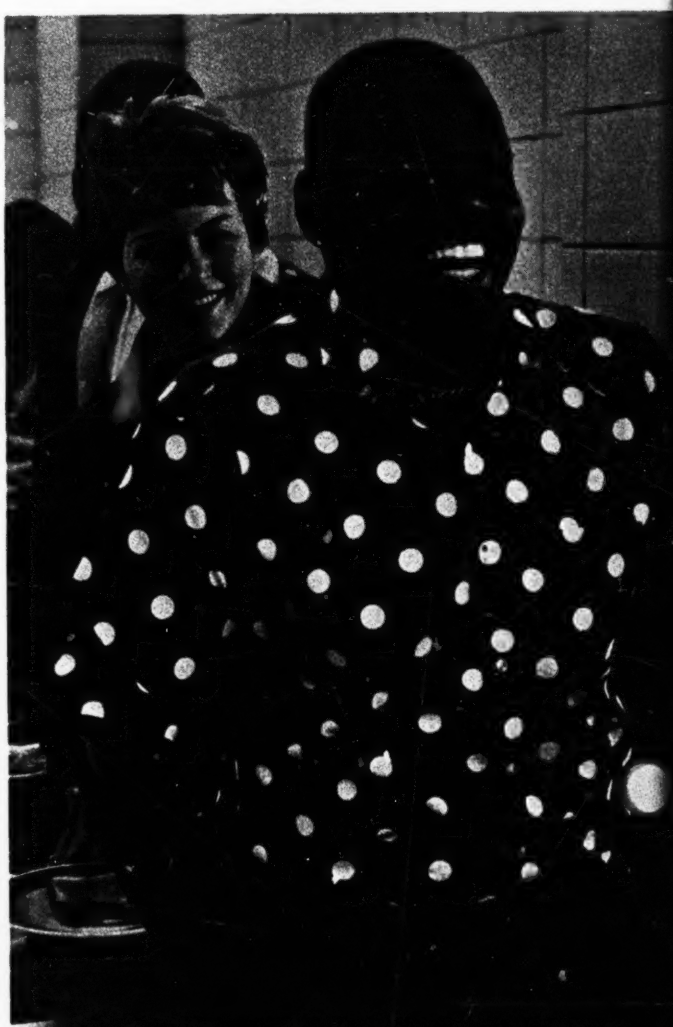


Table of Contents

Preface 1

The Initial Step 5
From crisis to idea: extracts from the document that led to the development of the Pre-College Program

A Brief History 7
From idea to reality: chronology of significant events in establishing the Pre-College Centers

An Introduction to the Pre-College Program 10
Our philosophy and mode of operation; the people who plan the Program and those who run it—and how these affect the Program participants

The Mathematics Program 14
Our teaching methods, material, and rationale—in mathematics

- **Inside a Math Class** 16
- **Excerpts from a mathematics unit** 18

The English Program
Our teaching methods, materials, and rationale—in English

- **Inside an English Class** 20
- **Excerpts from an English unit** 26

The Structure of Learning 28
The patterns of intellectual discourse and interaction among students, teachers, and program assistants that give a unique structure to the Program

A Sampling of Student Activities 31
Photographs, sample student work, and accounts of field trips that reflect the variety of workshops and special activities offered by the Centers

An Informal Evaluation 36
A panel of former Pre-College students discuss the Program

A Systematic Evaluation 37
Plans for an objective appraisal of the Program

Sample Data on Pre-College Students: 38
Family Income Statistics of Participants in One Pre-College Center
Current College Enrollment of Summer 1965 Pre-College Alumni

Persons Associated with the Program for Pre-College Centers 39

"It is my belief that this program will be of invaluable aid to the college student. First, because it teaches in an expository rather than a depository manner. The math helps one to think rather than to memorize everything, and the English teaches one to express himself. Actually what you know won't help if you cannot express it."
Pre-College Student
Summer, 1965

Several pictures courtesy of New Day — weekly supplement to Forward Times, Houston, Texas.

The Initial Step

Alarm over the drop-out rate at Negro colleges leads to the establishment of the Program for Pre-College Centers.

Toward the end of January 1963, a committee of presidents of predominantly Negro colleges came to Washington, D. C., to discuss with Dr. Jerome B. Wiesner, at that time Science Advisor to President Kennedy, the educational crisis that threatened such colleges. In April, the problem was brought before the President's Science Advisory Committee Panel on Educational Research and Development at the first of a series of meetings. Research advisors and other educators were called in to assist the Panel in investigating ways of radically reducing the drop-out rate and improving the conditions of these colleges. The result of this investigation was a report entitled "Program for Negro Colleges," prepared during the summer of 1963 by Dr. Samuel M. Nabrit, President of Texas Southern University, Mr. Stephen White, Assistant to the President of Educational Services Incorporated, and Professor Jerrold R. Zacharias of the Massachusetts Institute of Technology and Chairman of the Panel on Educational Research and Development. The Carnegie Corporation of New York expressed an interest in the problem facing the Negro colleges and approved a grant to Educational Services Incorporated for establishing a program to explore and possibly implement some of the recommendations in the report. The following section from this document became the basis for the development of the Program for Pre-College Centers:

Neither in his school nor in his home has the Negro student been encouraged to acquire the habits of crisp, economical speech or attentive listening. He is not the master of his own language, and it does not serve him efficiently as a tool.

In a nominal sense, he has learned to read, but he is likely to read obediently, in response to a directive. He is the servant of books, rather than their master; he does not know how to seek, upon his own initiative, for knowledge or for delight in printed matter.

Somewhere during his schooling the relationship has been lost that should link formal education with his own human development as an individual within society. History, literature and the arts are mastered, if they are mastered at all, in relation to examinations and promotion; their true significance to the whole man is lost. They cease, in short, to be humanistic studies and become items in a curriculum that exists only for its own sake.

Similarly, the mathematics that the student may have mastered is barren of its true import. That it has relevance to the real world, and utility in dealing with the real world, has never been made clear. The student has learned to compute, and perhaps to state formal proofs, but these achievements, like his achievement in the Humanities, constitute a closed system referring in every instance to nothing but themselves.

His academic knowledge, for the most part, rests on the authority of his teacher or his teacher's textbook. In the discipline of school and college, he has little notion of how one sets out to elicit information which has not first been codified by someone else. Necessarily, he is quite capable of learning by means of experiment and mother-wit how one manipulates his social and domestic environment, but his approach to formal education is artificial and unreal.

These deficiencies must be remedied before the freshman can begin to profit from a college education.

It is proposed, therefore, that a complete body of learning aids be prepared, at the level of the Negro graduate from secondary school, dealing with Communications, the Humanities, Mathematics and Inquiry.

The first of these would deal with speech, listening, reading, and writing. It would be intended to relieve the Negro college of the necessity for remedial work in these subjects—and would enable the college to presume that its freshmen would be able to carry the basic tools of communication into their first year of instruction.

In the Humanities, the emphasis of the new materials would be upon the relationship between humanistic studies and the individual. The material would be directed toward a comprehension of the knowledge that the student has already accumulated, rather than upon the acquisition of new "facts."

Similarly, in mathematics, the attempt would be made to make the transition between mathematics-by-rote and mathematics as a tool. Finally, a laboratory course would concentrate upon the methods and purposes of laboratory inquiry as a general means of procedure, rather than as an element in building a coherent structure in one science or another.

The manner in which these materials are to be used would be allowed to remain as a matter that must be determined by experience. It might be advisable to add a fifth year of secondary school for students admitted to college; to require one or more intensive summer courses; or to remove the college-bound student from secondary school in February of his senior year and transfer him to special schools run by the Negro colleges themselves, for a concentrated effort during the nine months before matriculation. The materials should be flexible enough to bend to all these uses, and perhaps to others.

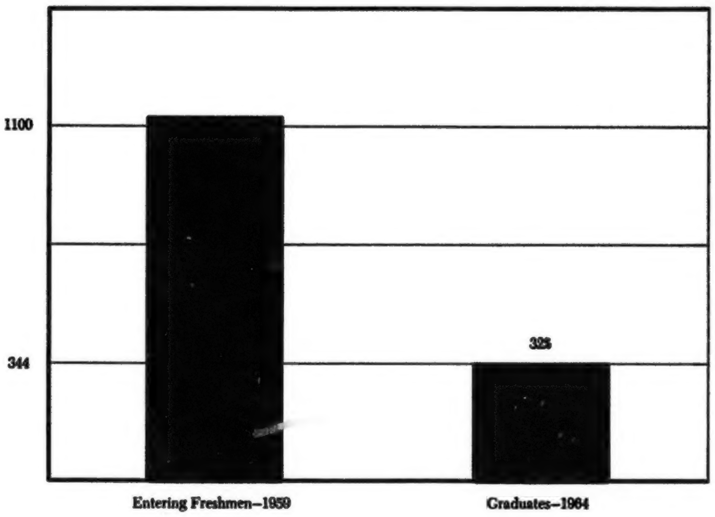
During the process of preparing these materials, the best available teachers from Negro colleges and secondary schools would be intimately associated with the work, and would provide part of a cadre of teachers intimately familiar with the materials. The first employment of the materials would be in a series of intensive summer institutes, in which a substantially larger number of teachers and professors would be trained in their use.

It might be added here that the existence of such materials would be of immediate benefit to a far larger group than merely the Negro students. Remedial materials of this sort are in general demand throughout the United States—where in general the level of skills in Communications, the Humanities, Mathematics and Laboratory are inadequate for the requirements of higher education.

Preparation of these materials, it should be stressed, will require a major effort. It will be necessary for scholars and teachers, in large numbers, to give their full attention to this program over a period of three or more years, and for an even larger number to contribute their summer time.

In compliance with the recommendations of this report, the Pre-College Group of Educational Services Incorporated designed the Program for the Negro student (five of the six colleges where Centers are located are predominantly Negro institutions); other studies, however, revealed that the description of the student in this report was applicable to all youth from rural and urban slum areas. Grants from the Office of Economic Opportunity have made it possible to expand the Program to include all interested students from such low-income families.

A SAMPLE CLASS AT A REPRESENTATIVE NEGRO COLLEGE



The drop-out rate (nearly 70%) at such colleges led to an investigation of ways to alleviate the problem, as reported in "Program for Negro Colleges."

A Brief History

1963

April The Panel on Educational Research and Development of the President's Science Advisory Committee began investigating means of combatting the educational crisis faced by Negro colleges.

Summer The plight of Negro colleges and recommendations for improving such schools were presented in the report, "Program for Negro Colleges."

October An Ad Hoc Committee* on Education in Predominantly Negro Colleges was appointed to assume temporarily the responsibility for exploring programs for improving Negro colleges. Educational Services Incorporated offered the Committee its assistance in setting up a pilot program that would implement the recommendations of the report.

1964

March The Carnegie Corporation of New York granted funds to Educational Services Incorporated, for use in initiating a five-year developmental college-preparatory program for Negro students.

Summer A writing conference was held at Pine Manor Junior College in Wellesley (June 22-August 14), at which the preparation of materials for the English and mathematics curricula was begun. An office for the Pre-College Center Program was established in Watertown. The organization of Centers to be established in southern cities was begun.

1965

March Six Pre-College Centers opened at Morehouse College, Atlanta; Fisk University, Nashville; Texas Southern University, Houston; Howard University, Washington, D. C.; Dillard University, New Orleans; and Webster College, St. Louis. Some 1200 high school seniors met weekly during the school year for English and mathematics classes at the Centers. A grant from the Carnegie Corporation of New York supported the operation of the Centers from March to June, 1965.

April A joint meeting of the Center Directors, representatives from the Office of Economic Opportunity, and the Central Office of the Pre-College Program (now, the Curriculum Resources Group) was held at ESI to discuss the future plans of the Centers. It was decided that all students from families within a specified low-income range would be eligible to enroll in the Pre-College Program in their communities. It was also decided that the summer sessions at the Centers would be extended to residential programs, offering morning classes and afternoon workshops of additional educational and cultural activities. The Office of Economic Opportunity accepted the responsibility for financing the Centers as a demonstration project for "Upward Bound" programs.

Summer The six Pre-College Centers received grants from the Office of Economic Opportunity to operate eight-week residential sessions for approximately 900 students. During this time, June 14-August 6, a second writing conference was held at Wheelock College in Boston, Massachusetts; participants at the conference visited the six Centers and continued developing instructional materials in English and mathematics. The Neighborhood Youth Corps of the Department of Labor provided jobs for the students from the close of the eight-week session to the opening of the college term.

October The six Centers re-opened with grants from the Office of Economic Opportunity. Saturday sessions resumed for the new academic year.

1966

May Centers concluded Saturday Sessions for the academic year.

June The six Centers resumed the residential Summer Sessions. Each Center expanded to include 100-200 juniors who will remain in the Program for one year.

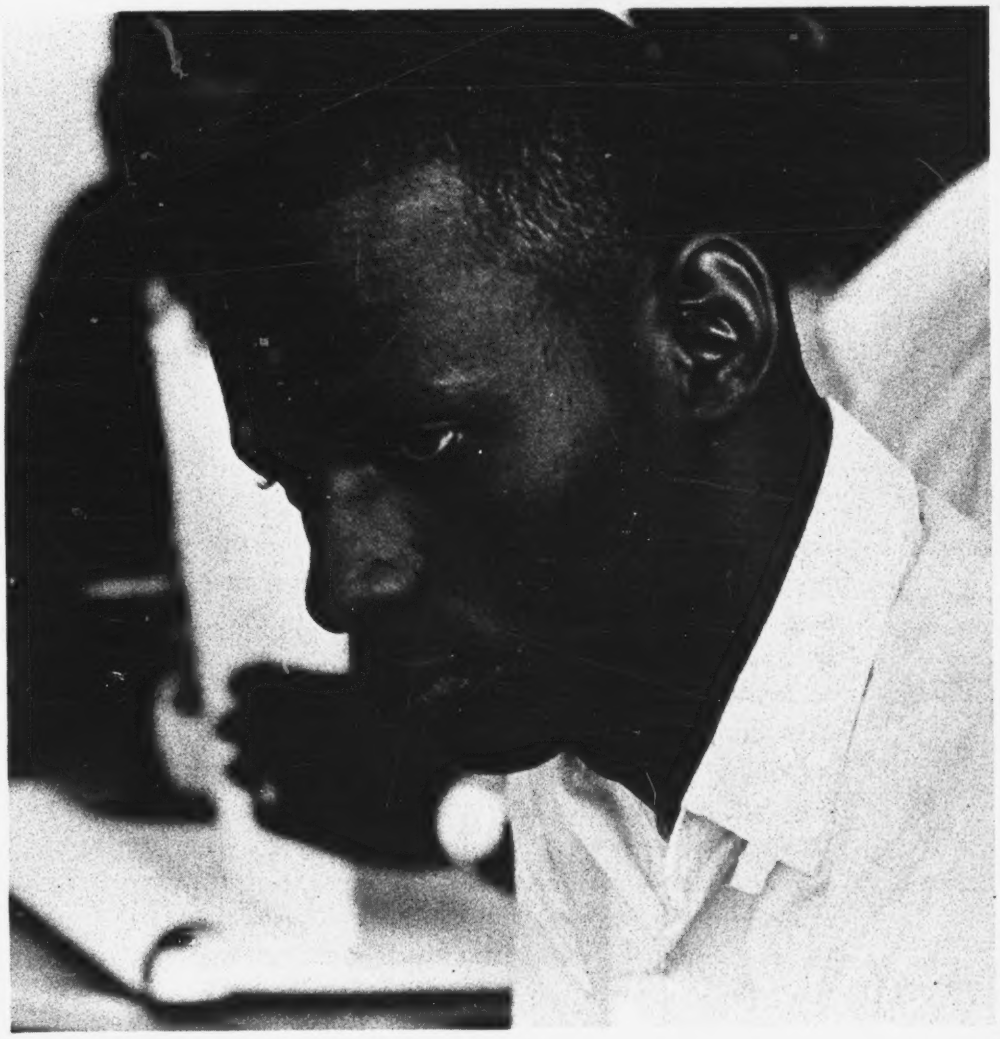
Summer A third writing conference for preparation of materials in English and mathematics was held at Pine Manor Junior College in Chestnut Hill, Massachusetts, for eight weeks (June 20-August 13).

---

*The original members of the Ad Hoc Committee are listed on page 40.

"In addition to whatever growing experiences the students are having, we who are the teachers are also growing a great deal. We are learning a lot about the thinking which the kids are doing and their ability, depth perception. . . . I think all of us are excited about what is happening both to us and what appears to be happening to the kids."

"The teachers don't try to make you learn; they just make their classes so interesting until the students want to learn as much as they can."



"In my opinion and not meaning to flatter the Program, I think it's great."

"I came to find the answer to college success. Instead I found keys: an open mind, the willingness to study and work hard, the right attitude and the determination to succeed. But the answer to college success, I know now, lies within me."

"Knowledge is pulled from the student instead of being poured into him."

An Introduction to the Pre-College Program

Nature of the Program The Pre-College Program is a unique design in inductive learning for the high school student from a family of low or modest income. It is a program in which the student is not "taught"; he is provoked to learn. It aims at encouraging him to integrate and profitably use his present knowledge, as he continues to increase it in a free and informal academic atmosphere. It endeavors to transform him from one who responds passively to learning into one who questions, analyzes, initiates, creates. It seeks to make him a full participant in all his classwork, to allow him—rather than his teachers—to become responsible for his education. It attempts to heighten both his self-image and his career chances. All of these objectives the Program is designed to accomplish through classroom experiences which focus on the student rather than on the subject matter, and through social interactions which confront him with a variety of intellectual and cultural challenges.

The Program is supported by grants from the Carnegie Corporation of New York and the Office of Economic Opportunity. It is presently in operation at six Pre-College Centers, located on the campuses of Howard University in Washington, Morehouse College in Atlanta, Dillard University in New Orleans, Texas Southern University in Houston, Webster College in St. Louis, and Fisk University in Nashville.

Mode of Operation Each Pre-College Center offers English and mathematics classes, special-interest workshops, cultural and recreational activities to about 200 high school seniors and juniors, who remain in the Program one full year. On Saturday mornings during the academic year and daily during the summer session, six selected teachers in each discipline conduct classes of not more than 20 students, using materials* that are developed to broaden the contexts of English and mathematics instruction, and to promote lively discourse among students and teacher. After the morning classes, during both sessions, the students meet informally with undergraduate and graduate students, drawn from local colleges and universities, who serve as program assistants. Working together, the program assistants and pre-college students organize special activities that complement the morning's academic studies, and, under the guidance of the Center counselor, investigate the practical problems of choosing a career and an appropriate college in which to prepare for it.

During the intensive eight-week summer session, the students are in residence on the campuses where the Centers are located. This sustained contact with the students allows the Centers to increase the variety of afternoon workshops, special classes, field trips, and cultural events that each offers. In addition, teachers, program assistants, and students plan jointly other afternoon and evening activities that take full advantage of the special skills of individual staff members and the cultural resources of the community. Thus, the diversity of the afternoon and evening programs is an important facet in the students' development.

People Associated with the Program The Curriculum Resources Group, at Educational Services Incorporated in Newton, Massachusetts, has assembled a confederation of teachers, scholars, and writers to work on the development of new materials in mathematics and English. Professors of physics, mathematics, English, and humanities, from Massachusetts Institute of Technology, University of Rochester, Morgan State College, Simmons College, Notre Dame University, and Howard University; high school English and mathematics teachers from Massachusetts, New York, New Jersey, and Washington, D. C.; industrial research physicists; poets and writers, meet with the resident staff of the Curriculum Resources Group to prepare the course materials used in the Program. Teachers from this group visit the Centers, hold demonstration classes, and consult with Center teachers on the evaluation of existing materials and the creation of new ones. The Curriculum Resources Group also coordinates the operations of the Centers; assists the Center staffs in administering the Program; edits, distributes, and revises the materials for instruction; and conducts teacher-training and orientation meetings.

---

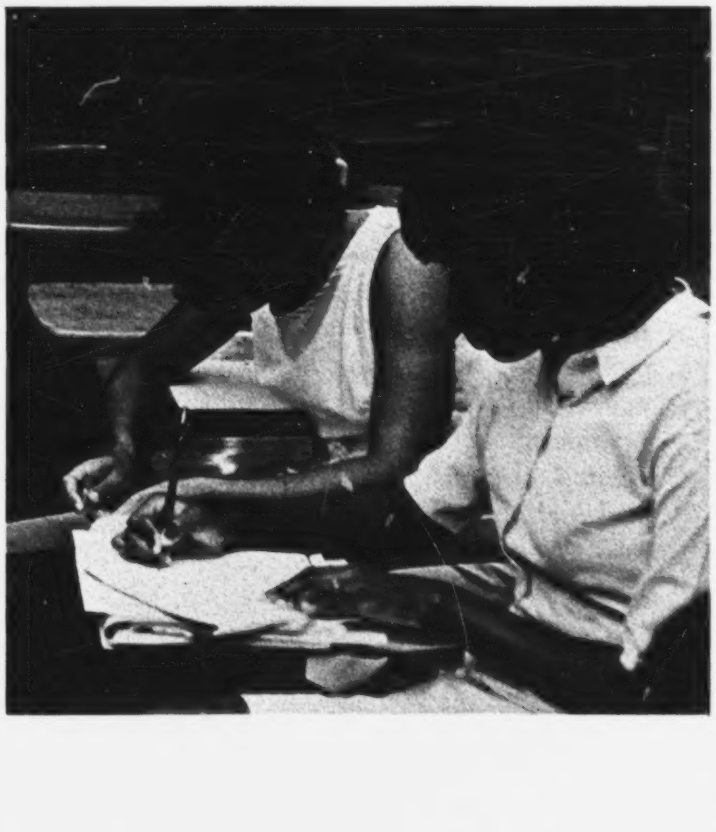
*These materials are described in detail in "The Mathematics Program" and "The English Program," on pages 14 and 20 respectively.

The Research and Evaluation Group, also at Educational Services Incorporated, looks objectively at the operation and impact of the Program. Since the Program is innovative, and since changes in the students vary greatly from immediate to long-range, from manifest to subtle, the Research and Evaluation Group utilizes varied research techniques for collecting and analyzing organizational and individual data. In this they seek to achieve a better understanding and assessment of the operation and effectiveness of the pre-college experience in fostering changes in academic performance, attitudes, self-image, and career development.

At the Centers, the staffs have been gathered from regional schools and colleges. The directors and counselors recruit and select teachers and students, and help to insure efficient operation of the Program; the competent and creative teachers guide the students through new learning experiences, both inside and outside the classroom, and assist the Curriculum Resources Group in teacher-training and orientation of new personnel; and the program assistants serve as models, friends, confidants, and advisers in helping the students profit from the many facets of the Program.

Accomplishments of the Program The Pre-College Program is designed explicitly to instill in the student a confidence in his own potentialities, and a recognition of his own capacity and responsibility for choosing and shaping the quality of his life. The structure of learning that has been developed for the Program introduces the student to sympathetic teachers, stimulating and cooperative classroom atmosphere, and varied range of experiences that are conducive to such personal and intellectual growth.

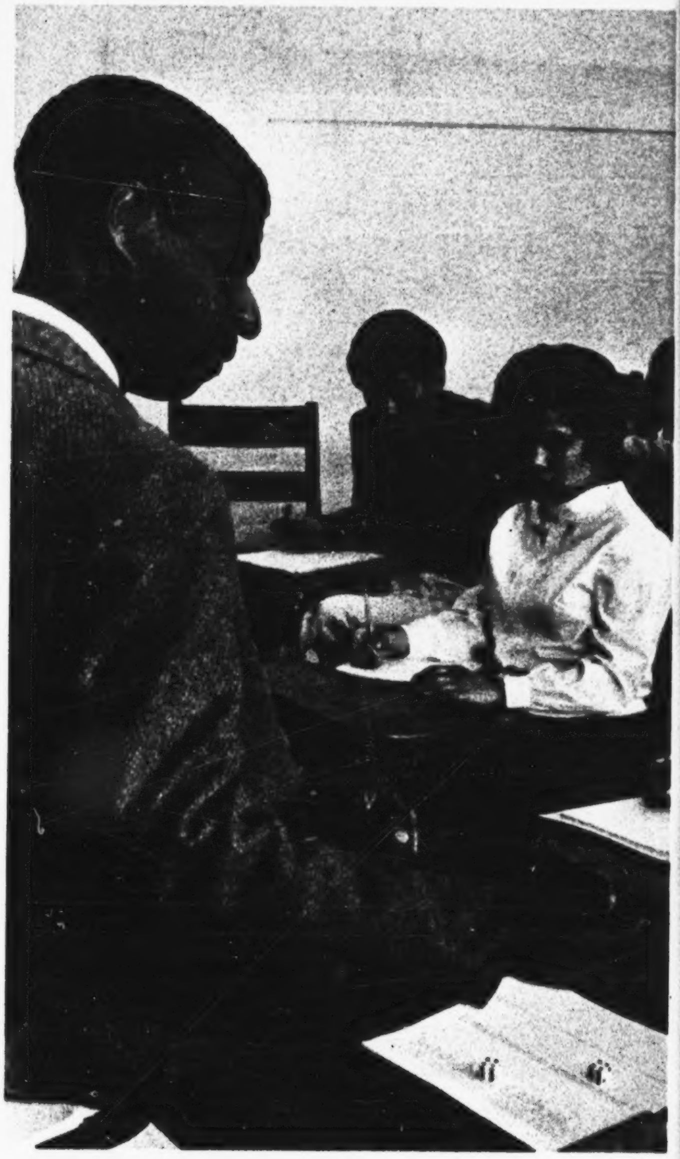
The excitement of the teachers and students, their comments on rediscovering the pleasures of teaching and learning—these are indications that both teachers and students benefit from participating in the Program. Reports from observers at the Centers express enthusiasm about the insight and perception displayed by students in class discussions. These observers have been gratified to see students who are frequently labelled "deprived" or "remedial"—and, consequently, often suspected of being intellectually inadequate—engrossed in reading and discussing with increasing understanding the works of Camus, Thoreau, Darwin, and Hemingway; or absorbed in refining a "paper computing machine" they have invented, which will multiply and divide. It is, of course, too soon to know whether these benefits—the excitement in learning, the increased sense of self, the new insights and greater powers of perception—will endure. David Hawkins, an ESI consultant and former director of Elementary Science Study, has observed that on the journey toward comprehension, "all of us must cross the line between ignorance and insight many times before we truly understand."* By providing nourishment for that journey, by helping the students to cross that line again and again, we assure the permanent value of the Pre-College Program in the students' total development.



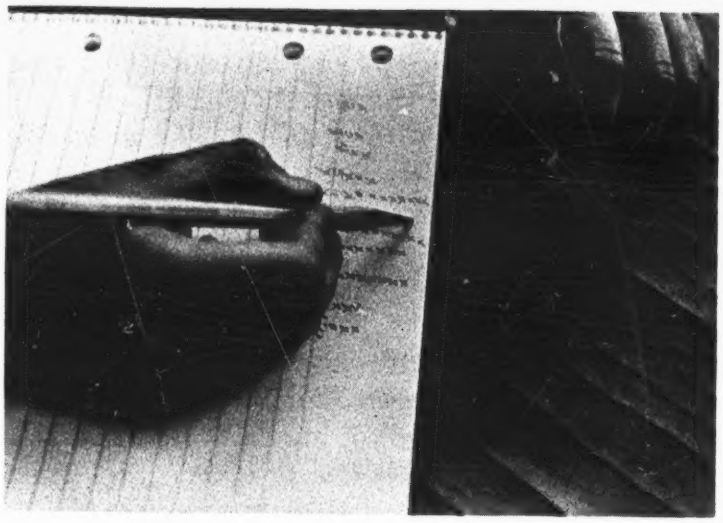
---

*From "Messing About in Science," *Science and Children*, Vol. 2, No. 5, February, 1965.

What goes on....

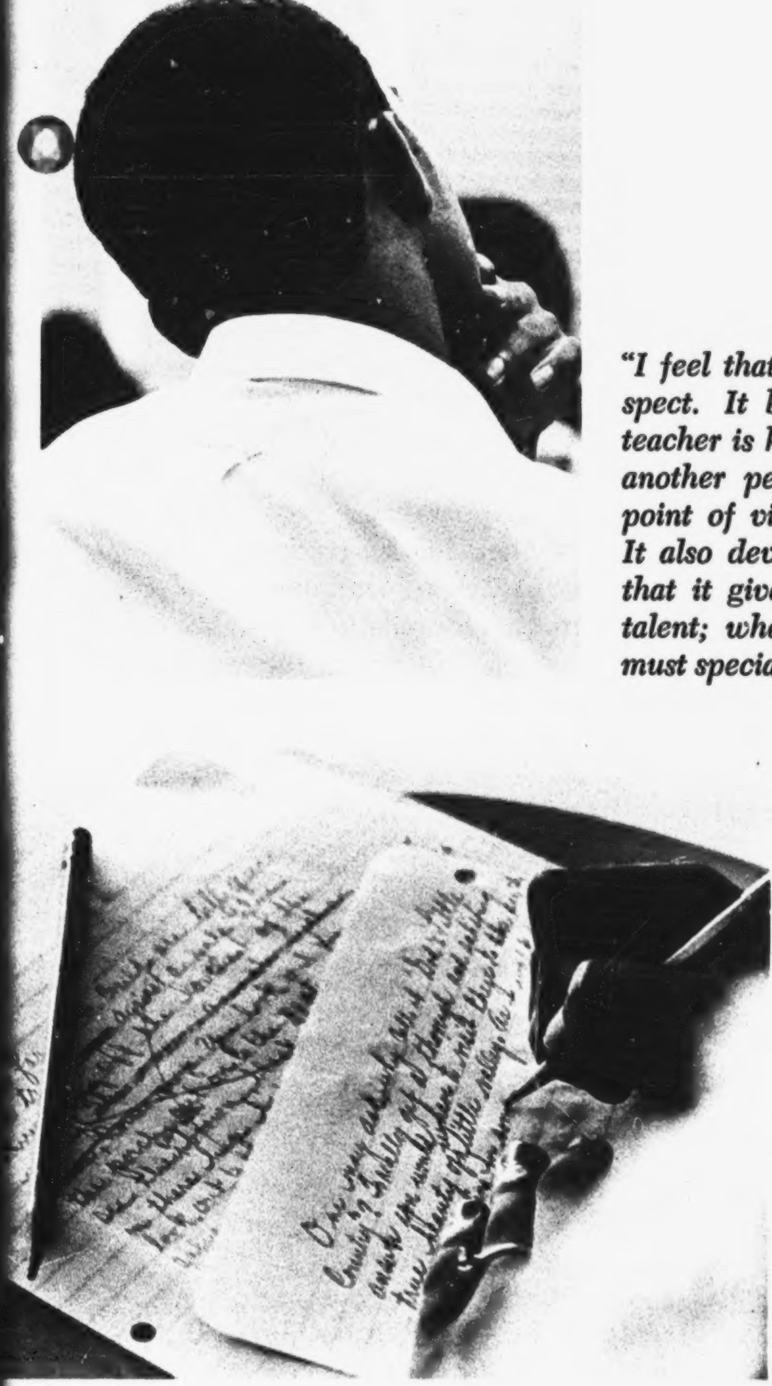


"While in these classes for the last month I have seen, excuse the expression, some of the dumbest people make reasonably intelligent statements."



"He shows you other things that are related to mathematics and you don't really know it until he leads you back into math with numbers and you can see the same thing happening that happens in everyday life. He goes back and uses numbers and he doesn't actually come out and say that this is related but he goes through a series of examples and just about everyone begins to see the relation. . . . Everyone really sees it, though he doesn't really say a word about it."

"The class on a whole is very good. We are free to speak whenever we please without feeling small, regardless of whether we are right or wrong. Sometimes I become lost, but before I know it, it has been explained. I've caught up again."



...in Math and English

"I feel that my English class is unique in one respect. It breaks away from the dogma that the teacher is king, and it also shows that just because another person sees a situation from a different point of view, that doesn't mean that it's wrong. It also deviates from our public school system in that it gives all students a chance to show their talent; whereas in our public school system you must specialize in memorizing facts."

"And in English—it is not exactly English. It is . . . a discussion period. I like it because . . . it is altogether different. . . ."

"The English class I attended was very stimulating. I was shown new areas of interest—art, music, and literature. I became more aware of these things, so much so that I actually became involved with them. This course made me think and learn to argue a point. I've gained more confidence in my speech and in my ideas. This, above all, is the most important gain of the Program."

The Mathematics Program

The Pre-College mathematics class, free from the pressure to cover a prescribed curriculum, offers the student an opportunity to try activities and investigations that will lead him to ask questions, and help him to discover on his own the underlying relationships and fundamental concepts of various mathematical areas. The emphasis in the classroom, therefore, is on exploration, invention, and the hunch.

There is a style of teaching that is intimately connected with this approach to mathematical learning. It looks to the responses of the students for the direction and progress of the class. It is a style in which the teacher understands the general structure and logic of the subject, and is aware of many of the alternative pathways within this framework; but in which the students choose the actual course of the inquiry.

The interaction in a class of students with this style of teaching and the mathematics materials will produce many learning sequences. The development of one of these sequences by a class may be compared to a path taken through a network of crossing and recrossing lines. There are many starting points in this network; many intersections of the paths as one progresses through it. While the network never ends, there are places where one may pause and reflect before moving further, and each of these places can be reached by a great variety of routes. Although there is no one conclusion at which everyone must arrive, there is a sense of increased understanding at each of these resting places.

The task of the mathematics curriculum innovator, then, is multi-dimensional. He seeks out a particularly fruitful topic and organizes the written and physical materials which can facilitate its investigation. He provides the teacher with the necessary background information which will allow him to move confidently in the area, and which will strengthen his ability to recognize the relative usefulness of various student questions and suggestions. Finally, the innovator, using results obtained in trial teaching, indicates how the topic has proceeded in some classes.

The following classification of mathematics units is based on the mode of introducing the topic. In each category one unit is described in some detail.

1 Units Involving Physical Apparatus
Surface Area. Using wooden blocks, students determine the surface area of various combinations of cubes, working toward the formula for n cubes placed end to end. The unit proceeds to rectangular blocks, first uniform in size, then varying in length, and the students develop techniques for analyzing the area of different combinations of blocks.

Others:

Crazy Dice
Introduction to Computer Programming
Switches and Batteries
Geometry with Wax Paper
Polygons and Polyhedra
Nomographs
A Finite Geometry
Informal Geometry

2 Units Involving "Games"
The 1 to 20 Counting Game. This counting game can be easily analyzed by the students; however, variations of the rules can make the winning strategy increasingly complicated. The original game admits no tie and can always be won by the first player; yet it is possible to change the rules in such ways that the second player can win, or that a tie can result.

Others:

15 Puzzle
Art of Dueling (Some Old Math)
Probability and Game Strategy

3 Units Involving "Geometric Situations"
Map Coloring. Students begin by coloring geographical maps, gradually being prodded to abstract the problem; 2-colored maps are studied, and the 4-color conjecture is formed. Students then move from the plane to the sphere (showing that the problem is the same in both cases, with sheets of rubber to help), and to the regular solids. Finally, proofs of the 5-color theorem and Euler's Theorem are developed (the latter being applied to

the proof that there are at most five regular solids).

Others:

Pythagorean Theorem
Euclidean Algebra
Relativity

4 Units Involving "Numerical Situations"

Empirically Derived Functions. In this unit the idea of function is approached from several directions. At first, to give practice in coordinate representation, students play Coordinate Tic-Tac-Toe; they then experiment with the graphing of linear functions and establish the significance of the various constants. Another approach is through "Guessing Functions"—the students develop strategy for analyzing data and guessing the rule that produced it. This leads into an operational approach to graphs, "Getting Curves in the Right Places," which concentrates on quadratics. Finally, there are "empirical" games, such as Peg Game and the Tower of Hanoi, both of which yield interesting functions.

Others:

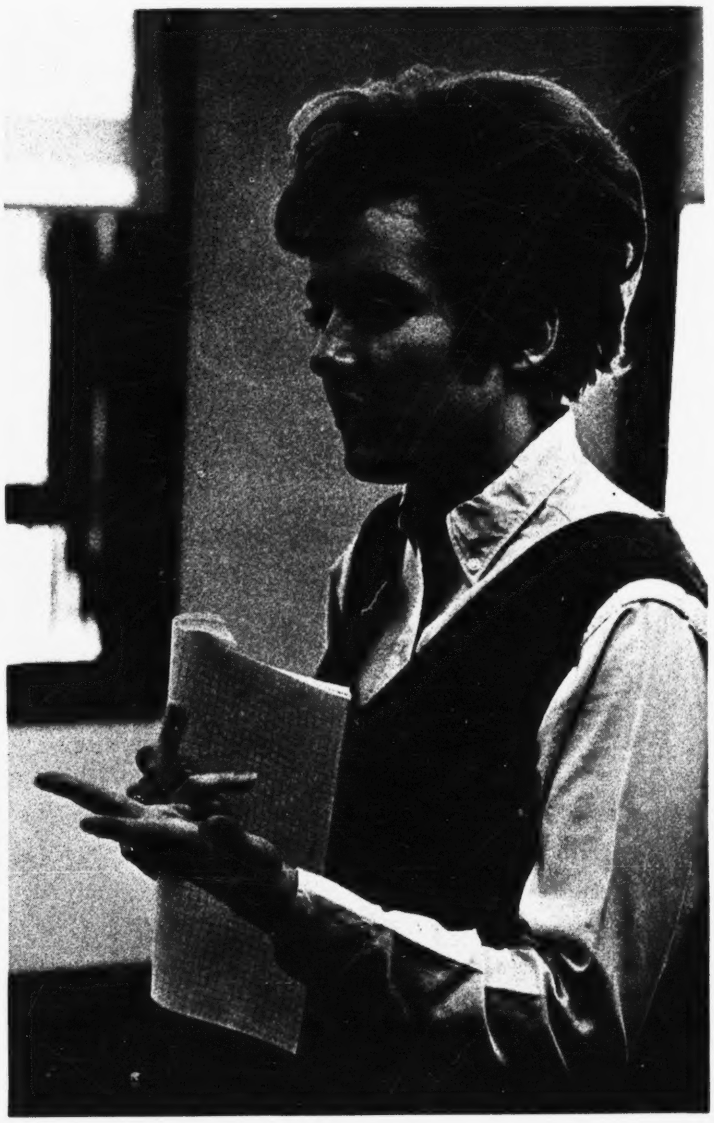
Associated Numbers
Scoreboard Functions
Transformations on a Number Line
Primes and Sieves
Transformations in a Number Plane

5 A Unit Involving "Inference Schemes"

The plan of attack in this area is to put the students into the position of examining the logic which they and others use. Under what conditions is a statement considered "reasonable," and why? By this road, which begins at the end, the unit deals with logical connectives, inference schemes and proof.

6 A Parallel Unit in Math and English

Cryptography. Principles of reasoning that are sometimes applicable to the study of mathematics, language, and literature are introduced to the students via the science of cryptography. The mathematics portion deals with elementary examples of transformation and substitution. These mathematical concepts provide a framework for understanding similar types of manipulation of symbols that are used in codes and ciphers. The English portion deals with word order, letter frequency, and basic language patterns, and moves from solving simple cryptograms to exploring the use of cryptology in stories like Poe's *The Gold Bug.* The unit is flexible enough to allow the two portions to be handled simultaneously, consecutively, or independently.



Inside a Math Class

An example of part of a mathematics unit is the work with guessing rules and nomographs. The following discussion indicates briefly how teachers in the Centers have developed the ideas in the unit, and how the students' responses have contributed to this development.

The teacher thinks of a rule (e.g., "double the number and subtract seven"), and the students are set to guessing what the rule is. Although he will not tell the rule, the teacher will give the students, for any number they wish, the result of applying the rule (e.g., the above rule yields negative one when supplied with the number three). Students also make up rules and assume the role of teacher, while the rest of the class guesses their rule. As students ask what result a rule gives for various input numbers, the information gathered can be tabulated on the board in the form of a truth table. Such a table, for another rule, is shown below:

□	△
–3	3
–2	0
–1	–1
0	0
1	3
2	8
3	15
10	120
100	10,200

Here, □ is the number put in, and △ is the result after using the rule.

Schematically, □→△

or,

using 2, $\boxed{2} \longrightarrow \triangle 8$

A table such as this shows that the class has developed some strategy for guessing; they know that certain numbers are most useful to ask, and they have found a fruitful way to organize them.

There are many ways to discover the rule that is being used to generate the table above, and, left to their own devices, most classes come up with a great variety of valid approaches. This is a strength of the topic: it leaves a wide latitude for student participation and contribution. Some students may notice, for instance, that the △ column can be re-expressed as a product:

□	△
–3	3
–2	0
–1	–1
0	0
1	3 = 1 · 3
2	8 = 2 · 4
3	15 = 3 · 5
10	120 = 10 · 12
100	10,200 = 100 · 102

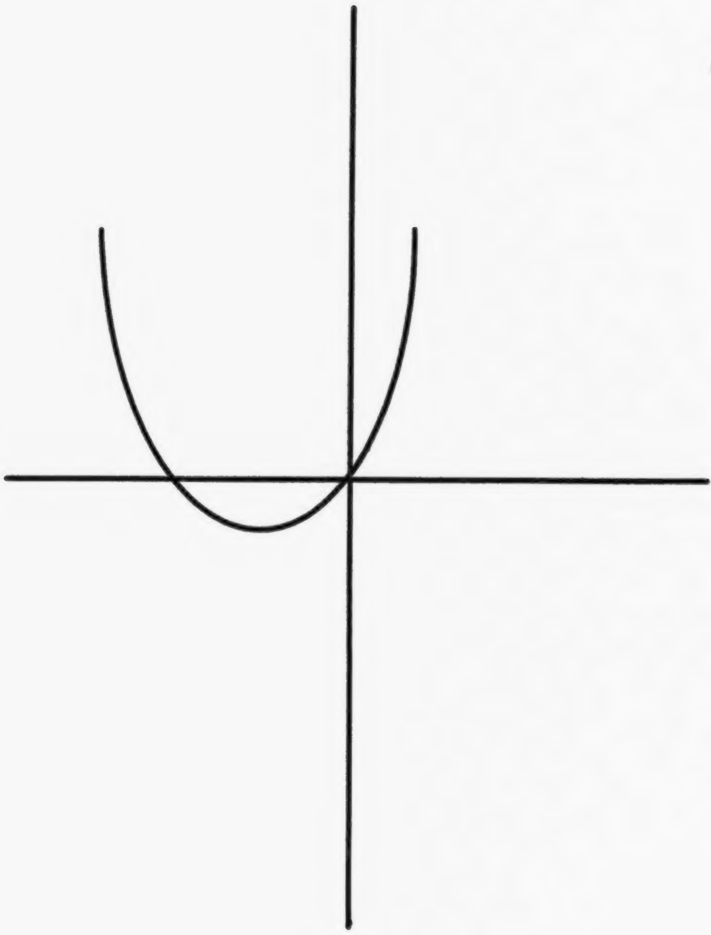
This pattern is most obvious where □ is greater than 0, but checking back shows that it also works for □ equal to zero and for negative values. The rule is □ x (□ + 2) = △.

Other students, however, may choose to look at the difference pattern, generated by finding differences between consecutive numbers in the △ column, and then performing the same operation to find the difference of the differences:

□	△		
–3	3		
		–3	
–2	0		
			2
		–1	
–1	–1		
			2
		1	
0	0		
			2
		3	
1	3		
			2
		5	
2	8		
			2
		7	
3	15		
10	120		
100	10,200		

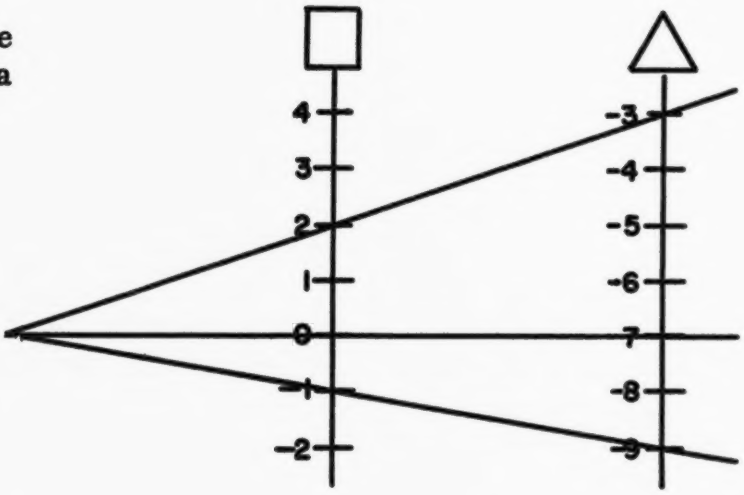
The constant second difference of 2 seems significant, and, after looking at the difference patterns of other known equations, students can discover that this rule has a $\square^2$ term. Further analysis quickly produces $\square^2 + (2 \times \square) = \triangle$ as the rule. Is this a different equation? This is an important question to consider.

Still another student, however, may graph the points given in the table and analyze the parabola that results:



The important point is that the possibilities are numerous, and the mathematical sophistication can be as great or as little as each student is capable of working with.

At the same time, the nomograph can be introduced as an example of a "machine" that works by a rule. The diagram below shows a two-line nomograph that is a "doubling, minus seven" machine.



The two lines drawn from the point on the left through the □ line to the △ line illustrate how to use this nomograph to find the value of △ when □ is 2, or when □ is negative one. The next question may be to try to invent a tripling nomograph, or a halving nomograph. How does one place the point and two lines so that the machine works by another rule? More difficult still is the problem of inventing a squaring machine, which can lead into exponents and logarithmic scales. Again the field is rich, and the number of possibilities immense.

In both of these topics, Guessing Rules and Nomographs, the sequence of investigations will largely be determined by each class, with its members working independently at times, and as a group at other times.

The emphasis is on the *process* of inquiry more than on the product; on establishing some basis for the thinking, more than on the conclusions. This is why any description such as the preceding can only be an example of how a unit might proceed, and not a prescription for how it should proceed.

Excerpts from a Mathematics Unit

Surface Area This unit can be as long or as short as you like. The first part could be used as an introduction and the last questions as problems to think about or as part of an assignment.

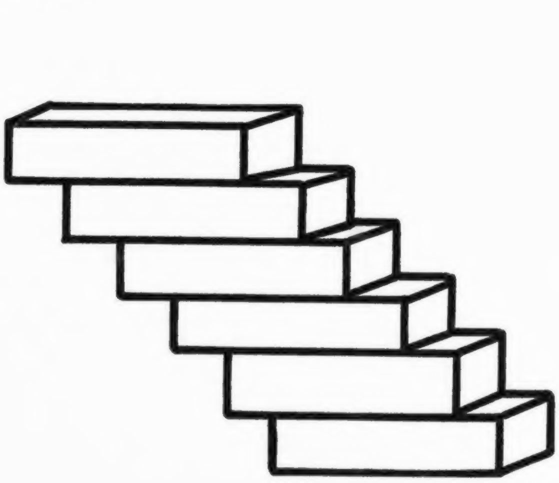
It will be essential that you have some kind of visual aid to be sure the students understand the questions being asked. Balsa or other wood, styrofoam, or any other kind of material could be used for the blocks. Two-inch cubes and rectangular solid blocks two inches by two inches by ten inches seem to be about the right size, large enough for everyone to see, and yet not too large to handle. About ten of each size should be enough. You may want to have enough for each student, in which case a smaller scale could be used.

If each student does not have blocks, then it might be useful to distribute quarter-inch coordinate paper. This would make it easier to sketch diagrams that could be helpful.

One other note, the questions at the beginning may seem trivial for high school students. However, we have found that without these questions many students are perplexed as to what we mean by surface.

Begin by discussing the cube. What kind of figure is it? How many edges? How many corners? If we wanted to cover the surface with postage stamps and each stamp would cover one face, how many stamps would it take? (6) (Throughout this unit the blocks are suspended in space.) . . .

Now build a figure like the one below. Each overlap is one unit. It will be better if you use six or seven blocks.



What is the surface area of this figure? (For six blocks, each five units long; 92 sq. units.) As soon as some students have given answers to the problem with six (or seven) blocks, ask immediately how you would find the surface area if we had 100 or 1000 blocks arranged like this. What are some general methods that would work for any number of *n* blocks, any length? (Note: This might be posed as an assignment for those students who are interested.) . . .

Here is a sampling of other kinds of ideas you and your students might wish to investigate.

(1) Given some number of blocks, all of equal length, how would one arrange them to get the smallest possible surface area? The largest? What would happen if you varied the length of the blocks? Is there some general strategy for arranging any number of blocks of differing lengths to get the minimum surface area?

(2) If you have a block that measures 3 x 5 x 7 and you paint all the outside surfaces and then cut it up into unit cubes, how many cubes will have at least one painted surface? Two painted surfaces? Three? Four?

(3) A 3 x 3 cube is being sawed into 1 x 1 cubes. How many cuts are required if the pieces left by a cut may be repiled before the next cut?

(4) The length of a rectangular block is twice its width, and the height is two more than three times the width. The entire outside surface is painted. What must the dimensions be so that when the block is cut into unit cubes, the number with at least one painted face equals the number with no painted faces?

(5) Fill a 10 x 12 rectangle with the fewest possible squares whose sides are integers. (5 x 9 rectangle? 11 x 13?)

(6) What is the ratio of surface area to volume in a block which has a five-unit length?

Construct figures by placing blocks of the same size on top of one another. Investigate the ratio of surface area to volume.

When will the ratio be equal to one?

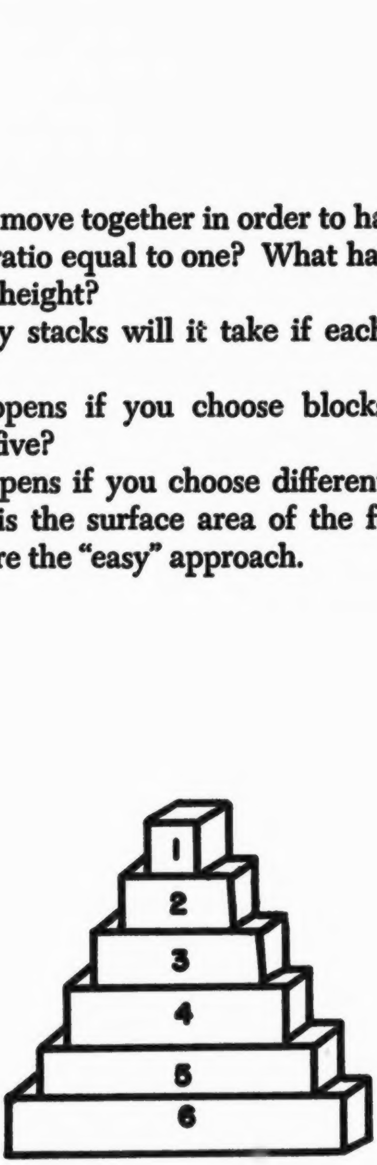
Using blocks with length five, build several stacks of blocks, each ten blocks high. How many stacks should you move together in order to have a surface to volume ratio equal to one? What happens if you change the height?

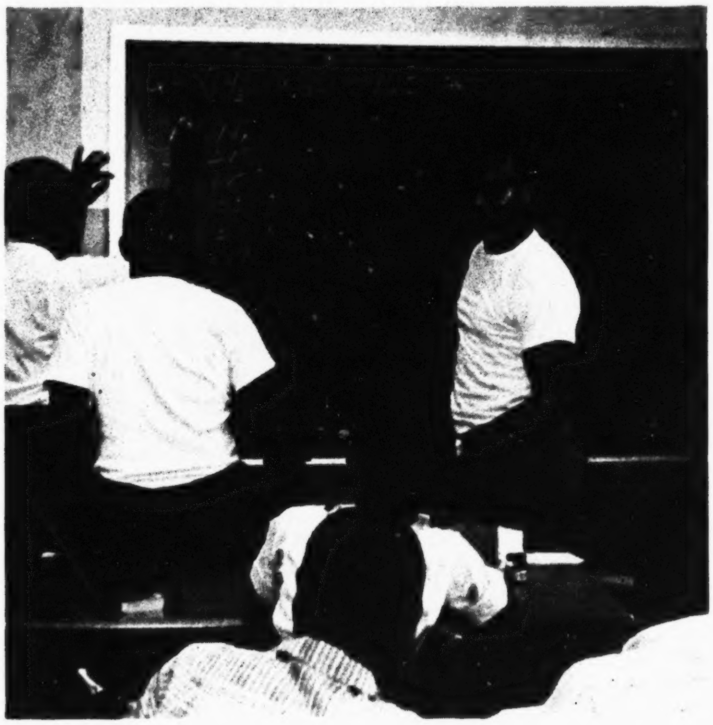
How many stacks will it take if each stack is 25 high?

What happens if you choose blocks of lengths other than five?

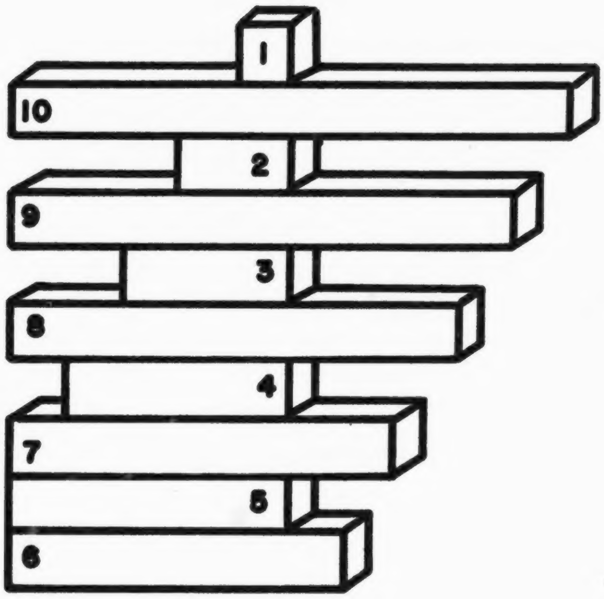
What happens if you choose different ratios?

(7) What is the surface area of the following figure? Beware the "easy" approach.





(8) Here is another arrangement. What is the surface area here?



What other problems or arrangements can you and your students think of? . . .

The English Program

The English Program for the Pre-College Centers has been designed to revitalize the English curriculum as a relevant frame of reference, which the students can use and profit from, both in their formal education and in their personal development. Since the English class is the logical domain for the development of language skill, the Pre-College English materials seek to provoke in the students an urgency for expression, which will lead them to discover, through their desire to convey clearly their own ideas and opinions, how dependent the effectiveness of their written or spoken communications in *any* area is on their skill in using English. The materials for instruction, therefore, have purposely been made broad enough to cut across artificial barriers in subject matter, fresh enough to avoid the emotional blocks and inhibitions that many students have built up against English courses, and exciting enough to arouse in students a willingness to learn.

The learning aids, which are an integral part of the English Program, have been specially selected to fit the unique character of the materials. An unusual assortment of films, phonograph records, and tape recordings is used, along with such innovations for the English class as paintings, sculpture, fossils, rocks—anything that will serve as additional foundation for the students in making smooth transitions from understanding the tangible to understanding the abstract. In addition, instructional techniques such as role-playing and Chamber Theatre are used to augment opportunities for students to become directly involved in the learning process.

The English materials differ considerably from one another in their immediate objectives and in the literary sources they require. But each is intellectually rigorous in its content, and each permits freedom and flexibility in its use. Furthermore, there is considerable interdependency among them: the increased skill and understanding that the students derive from a particular unit can reinforce their ability to grapple with problems raised in a later unit. The materials also abound with so many potential paths to learning that, although the main road in a given unit leads to a specific aim, the side roads can lead into any of the other units—or into a challenging, unexpected realm for which units have not as yet been developed. When the latter situation occurs, the teacher and students jointly design new units which will take them farther along the path the students themselves have chosen.

In the present stage of development of materials, the English units can be broadly classified into the following six groups. The order in which the groups are listed here, as well as the order of units within each group, is arbitrary. The teacher himself determines which units he will use, and in what order, according to his judgment of the needs and interests of his students. A typical unit within each group has been annotated here in order to illustrate the scope and special features of that group.

1. Units on Letters and Journals of Novelists, Poets, Artists and Scientists

The Letters of Vincent Van Gogh. The letters of Vincent Van Gogh, accompanied by reproductions of his paintings, provide the students with opportunities for gaining insight into the relationship between a man and his creative work, as well as between visual and verbal modes of expression. At the same time, they serve as vehicles for increasing the students' awareness and perception of the hopes and problems that are common to mankind. Through these letters and prints, reflecting Van Gogh's thoughts, emotions, and experiences, the students are brought into contact with a world that differs physically from theirs, but which nonetheless bears social and personal similarities. Van Gogh's loneliness and compassion; his despair at not being understood as a person or recognized as an artist; his relationship with his brother Theo and with his father—these are things which the students can understand immediately, and can often relate to their own situations. The paintings pictorially reveal the attitudes and emotions described in the letters, and thereby also reveal the link between the two means of expression. The film *Van Gogh* further reinforces the students' insight and understanding of this relationship by telling the story of the artist's life entirely through shots of his sketches and paintings, with narration drawn directly from his letters and diaries.

Others:

Picasso

Flannery O'Connor: What She Wrote and Why She Wrote

Charles Darwin

Thomas Wolfe: The Story of a Novel

Henry Moore: Notes on Sculpture

Jung-Freud Disagreement

Storytellers and Their Art

The Writer and His Craft

A Writer Draws a Portrait of Himself: Ralph Ellison and INVISIBLE MAN

A Writer Draws a Portrait of Himself: Katherine Anne Porter and "Flowering Judas"

2. Units on Language and Thinking

An Approach to Style. Since principles of language and thinking—such as style, organization, point-of-view—are abstract and generally difficult for students to understand or sustain interest in, the emphasis in units on such topics is always on starting with meaningful concrete objects that the students can manipulate, or with clearly illustrative literary excerpts that they can associate with related abstractions which they already understand. This movement from the concrete to the abstract, or from the simple to the more complex, is facilitated through the involvement of as many senses as the principle will allow. In this unit on style, three differing paintings on the same subject are exhibited in the classroom so that the students can first approach the concept on a visual level; then three differing versions of the same melody are played, for detection of style in an auditory medium. If necessary, a tactile approach is employed with wood carvings or small sculptures in order to provide a working basis for detecting stylistic differences on the abstract levels of language, in literature.

Others:

Sunrise: Style and Point-of-View

Organization

Symbolism

Taste

Point-of-View

Straight-Seeing, Straight-Thinking, Straight-Writing

Chamber Theatre Technique: An Approach to Point-of-View in Narrative Fiction

3. Units on Literary Genres

An Introduction to Poetry. As in all of the genre units, the abundance of materials from many nations and literary periods makes it possible to present in this unit representative selections that neither repeat the students' previous experiences with poetry nor anticipate those they will have in college. This introduction includes an anthology of "good" and "bad" poetry, an analysis of each selection, and suggestions for what aspects of poetry might be emphasized in this initial unit. The aim is to have the students *enjoy* poetry as they develop taste, discrimination, and meaningful criteria for distinguishing between "good" and "bad" poems. The manner in which the unit is presented allows the students to listen to the distinct "voice" of the genre, as well as to the different rhythms of the poems themselves. Out of their own curiosity, the students begin to probe the meaning, forms, and effectiveness of the selected poems, and through them, of poetry in general. Last year, when E. E. Cummings' poems "in Just—spring" and "Buffalo Bill is Defunct" were read to the students, they were first amused, then intrigued by the strange music of the sounds: the brisk allegro tempo of some phrases followed by the halting largo of others. The students were eager to see how the words were written; to know how one can tell when to rush the words and when almost to stop with them; to understand the intricate relationships between sound and form, and between form and meaning. Their enjoyment of Cummings' poems was the catalyst for their gaining valuable understanding about this and all poetry.

Others:

Negro Poetry

CLAY: Darwinian Concept and Victorian Poetry

Poetry as Experience

On Orwell's THE ROAD TO WIGAN PIER

Haiku

Voices in the Arts

Leroi Jones' THE DUTCHMAN

Camus' CALIGULA

Thurber: Fables and Reading for Pleasure

4. Units on the Immediacy of Language

The Urgency for Expression: The Diary of Anne Frank and the Letters of Sacco and Vanzetti. The impact and emotional power of language are demonstrated in selections from the diary of Anne Frank and the letters of Sacco and Vanzetti. The emphasis in this unit is not on the question of guilt or innocence of the two anarchists, nor on the plight of the young Jewish girl during World War II; rather, it is on man's urgent need to communicate, and the force of expression that often springs from this need. The students study and analyze the diary and the letters in order to discover some of the ways in which these untutored writers were able to achieve immediacy and effectiveness in their use of language.

Others:

Speech Styles: "Square" vs. "Hip"

Truth vs. Fiction

The Living Newspaper

A Word is a Feeling

Mr. Arbuthnot—The Cliché Expert

The Critical Faculty: THAT'S WHERE I'M AT, A Film

THE WORLD'S GREAT SPEECHES

Student Writing: The Effective Use of Descriptive Detail

5. Units on Issues and Ideas

The Hero-in-Jail. The purposes of this unit are to stimulate the students to think, talk, and write, clearly and with understanding, about the issue of civil disobedience, which is a vital part of their world; and to have them consider this issue in both its historical and contemporary contexts. Documented instances of civil disobedience from Socrates, through Thoreau, to Martin Luther King, Jr., are read by the students, and discussions are based on the various views of the individual's relationship to society and the responsibilities that each view of this relationship entails. Supplementary readings enlarge on the theme of civil disobedience, and also provide some interesting contrasts between the hero who is a victim of the jail and the hero who uses jail as a weapon.

Others:

To Kill a Mandarin

Who Am I?: The Search for Identity

The Unreasonable Man

The Press and Local Power

On C. P. Snow's TWO CULTURES

The Press and World Power

THE WINNER, A Film

The Dilemma of Youth

Loneliness

On NIGHT: The Dilemma of Moral Responsibility

6. Parallel Units in English and Mathematics

Alice in Wonderland. An adult reading of *Alice in Wonderland* and *Through the Looking-Glass* gives the students practice in recognizing and interpreting symbols and imaginative meanings suggested by the literal text, with special emphasis on correspondence between Alice's adventures and the theme of "growing up." The students are also encouraged to examine the field of nonsense literature, including the use of game backgrounds. The proposed mathematics portion of this unit will include logic and mathematical principles in game stratagems—particularly chess strategy, which plays such an important part in Lewis Carroll's books. Suggested extensions are afternoon workshops in chess and other games of logic.

Another Parallel Unit: *Cryptography*

Inside an English Class

An English unit consists of the required source materials—the only materials that the students receive; a guide to suggested teaching procedures, including possible writing topics and extensions of the unit; an account of how the unit has proceeded in trial teachings; and a list of recommended supplementary materials, such as related books, films, and records, which the Center provides. What takes place after the teacher and students have their materials for a given unit will vary from class to class.

In the unit, "Student Writing: Effective Use of Descriptive Details," the source materials, "Models for Descriptive Writing," are drawn from authors such as Richard Wright, John Steinbeck, Helen Keller, James Baldwin, Ernest Hemingway; and from such poets as Dylan Thomas, E. E. Cummings, and Theodore Roethke. The students' reading, writing, and discussion are based on the methods various writers have used to achieve vivid imagery for conveying ideas or sensory impressions.

One of the selections, an excerpt from Richard Wright's *Black Boy,* generally rouses considerable student interest. The excerpt consists of a series of descriptive sentences which artfully couple the depicted scene or incident with the sense impression it evoked: "There was the languor I felt when I heard green leaves rustling with a rainlike sound." Students react first to the images Wright conveys. They examine the images to see if these are consistent with their own experiences: Is the early morning dew like a "faint, cool kiss"? Do I feel thirsty when I watch "clear sweet juice trickle from sugar cane being crushed"? Does "hot panic" well in my throat and sweep through by blood when I see "a blue-skinned snake sleeping in the sun"? Some students, having had similar experiences, immediately acknowledge the graphic accuracy of the descriptions; others reflect awhile, compare Wright's descriptions with their own reactions, then demur, "It wasn't quite that way to me; it was more like . . . "

Often students are curious about the style in which the passage is written: a brief opening paragraph, followed by twenty-two sentences, each beginning in a similar way—"there was the delight . . . ," "there was the tantalizing melancholy . . . ," "there was the teasing and impossible desire. . . . " They ask whether the repetitions occur in one place in the book, as they do in their mimeographed copies. Would a writer deliberately be so repetitive? In one class, as everyone considered this question, a student justified the parallelism by calling attention to the rhythmic effect thus achieved, and the class reread the passage to detect this rhythm. As discussion resumed, various members of the class began to point out other discoveries they had made: the descriptions are composed of simple, concrete words; the impressions are based on all five senses; the overall effect is less pleasing without the rhythm of parallel sentences; each sentence includes a sensory impression as well as a detailed description.

After students have examined the passage and discussed their discoveries, they realize that Wright is describing what being alive *felt* like, and they conclude that the validity of his description rests as much on his vivid use of details and sensory perceptions as it does on the commonness of the scene or experience. At this point the students begin to make a conscious effort to examine their own perceptions of experiences and attempt to sharpen their sensory awareness. Using Wright's passage as a model, they describe "what being alive *feels* like" to them:

> *Just what does it feel like to be alive? Well, it feels wondersome and reflective as I watch a zillion blue-bright stars on the window screen during a rain. It feels light and jingling as I wander through the popcorn-neon world of an amusement park at night. It feels mysterious and serene as I watch a purple, then pink, then gold sunrise. It feels warm, bubbling, ticklish and happy as I share the experience of a bunch of "nuts." It feels lively as I hear the laughter of children, but it feels reflective, when I listen to one of the classicists. It feels shocking as my feet pound when I jump up and down in sheer frustration. It feels light and airy as I walk barefoot over a lush carpet. It feels monotonous, and yet consoling, as my feet fall in an uncertain rhythm over an endless stretch of pavement. It feels terrifying as I feel a sharp, breathtaking pain in my side that says, "Slow down and live." It feels hopeful as I meet a walking-bush type dog that's even odder than I am.*

To be alive is to disburden myself of the world during the split second I am floating free, defying the laws of gravity, in mid-air during a two-meter dive.

There was a refreshing tickle of wet grass on my ankles. The early morning breeze was blowing damply, clearing my foggy mind.

To be alive to me feels a mess. You are like yeast, a ferment, a thing that moves and may move for a minute, an hour, a year, or a hundred years. The big eat the little so they can continue to move, the strong eat the most and move the longest. To be alive is piggishness. You live to eat so you may continue to live. Yes, we live for our bellies' sake.

Being alive is feeling superior to someone who is inferior to me.

To me wonderful is entering into a filling station, smelling the extraordinary aroma of gasoline, which deadens the senses of reality, and releases an urge to drink all the gasoline in the world.

In another class, using the same unit with the same models, students express particular interest in the use of metaphor, such as the one from T. S. Eliot's "The Love Song of J. Alfred Prufrock": "I should have been a pair of ragged claws/ Scuttling across the floors of silent seas." In one class, for example, after discussing this metaphor the teacher asked if anybody would like to imitate this form, using an image more relevant to his own experience. One student volunteered and wrote on the board: "I should have been a tree/ Branching out the way nature wanted me to." The class became involved in a fervent discussion of the analogy between human and tree, which they gradually began to examine in terms rather too literal. The teacher brought up another analogy in order to help them resolve the difficulty: "Suppose I said someone were a rock of Gibraltar, what would I mean?" Everyone quickly recognized the metaphor as signifying strength. One student pointed out that the implied comparison did not mean that the person was literally a rock, nor that he wished to be one. Gradually others in the class began to realize that comparison in a metaphor does not require a total transference of roles, and the class returned to the student's analogy of the tree with a greater understanding of the way in which metaphor enriches an abstract idea.

Later in the same discussion, another student noted a difference between the anology using the rock of Gibraltar and that using the tree: "We all agreed at once what 'rock of Gibraltar' meant—that wouldn't be very good in a poem; but look how we argued about the meaning of the 'tree-idea'—that would make a poem more suggestive." Thus, through this student's observation the class was led to identify the difference between metaphor as cliché and the complex, because less obvious, poetic metaphor.

In a class such as this, as well as in other classes using the unit on Student Writing, discussions also touch upon the use of simple, descriptive details, the images conveyed, the rhythm of the passage, and the overall effect and how it was achieved. In addition, effective use of the students' own awareness not only of what they see, but what they hear, taste, smell, and feel, becomes a major concern. Then they are ready to construct their own images, using, in this case, Eliot's metaphor as a model:

I should have been a brook, where people could come and look.

I should have been a rattlesnake, moving in the lowest form.

I wish I were a denizen of the sea, hiding my loneliness in the deep.

I should have been a cloud, and drifted as part of the heavens.

I should have been a flower, withered from lack of sun.

I should have been the ocean, to spread out far beyond what the eyes can see, to roar fiercely in the wind and upon the shores.

I should have been a dinosaur, effaced by the footsteps of time.

I should have been a windowpane, shattered by a ball.

I should have been a tree, branching out the way nature wanted me to.

Though metaphor was used as a springboard to student writing in one class, and sensory impressions were used in another, both led the students through similar stages of observations of descriptive language. In each the students worked with concrete details rather than with vague abstractions; took the passages apart and put them together again; explored the total effect as well as the means for achieving it; and eventually, after a kind of five-finger exercise, arrived at the discovery that effective writing depends upon actual, observed details and vivid imagery, concrete language that is fresh and alive, rather than upon impressive-sounding but vague abstractions. In other classes the springboards may be found in still other models, but the conclusions nevertheless will be similar. This is the strength of the materials: there is sufficient latitude for each class to follow the direction it finds most interesting, yet each class arrives at comparable insights into the relationship of carefully observed details to vivid descriptive writing.

Excerpts from an English Unit

An Approach to Style

Materials:

1. RECORDINGS: 3 differing jazz styles—Dixieland, Swing, Modern Jazz—of the same composition. (Three versions of "Sweet Sue" are suggested and are available at the Centers, but any selection may be used.)

2. PRINTS: 3 differing painting styles of same composition
(Available at the Centers)—
Expressionism—"The Yellow Violin" by Dufy;
Realism—"The Old Violin" by Harnett;
Abstraction—"Musical Forms" by Braque.

3. EXCERPTS (APPENDIX A), FROM *A Treasury of Great American Speeches*, CHARLES HURD:
Jane Addams' Eulogy of George Washington;
Robert G. Ingersoll's Eulogy of James G. Blaine;
Carl Sandburg's Eulogy of Abraham Lincoln.

4. MIMEOGRAPHED EXERCISES ON STYLE:
The Faces of English—Appendix B
Paul Sails to Italy—Appendix C

Notes to the Teacher Although the primary objective of this unit is to have the students learn experimentally some basic concepts of style and, consequently, arrive at some definition of it, related questions are bound to be introduced. Some in the class may wonder about the influence of style on feeling or mood. For example, one student observes that a work seems gay to him, while another insists it seems sombre: why should the same work produce opposite effects in two individuals? Is the reason for this to be found in the individual or in the work? What is the relationship between the audience and the work, in this case, its style? Of course, these are not questions that the students may be able to answer for themselves, but the answers—if there are any—are not important at this time. What is important is that the students consider these questions when they come up, because their process of analyzing the validity of certain responses (e.g., "The Dixieland version seems gay because it reminds me of . . ."), their efforts at distinguishing between the act and the reaction, the objective work and the subjective evaluation, will help them in understanding the significance of style.

In some classes, as the students begin to realize that what has happened to the tune "Sweet Sue" in the three musical versions is similar to what has happened to the violin in the three paintings, they may be tempted to make unwarranted parallels between the musical styles and the painting styles, merely because there are three examples of each. When this occurred during a demonstration class, the teacher forestalled erroneous conclusions by introducing additional examples which, while serving to further clarify style, obviously discouraged attempts at making the music and paintings comparable. Other teachers, however, have pointed out that confusion is also satisfactorily averted by moving to the three prose selections, which certainly will not fit whatever forced categories some students may have established for the music and paintings.

Suggested Procedure

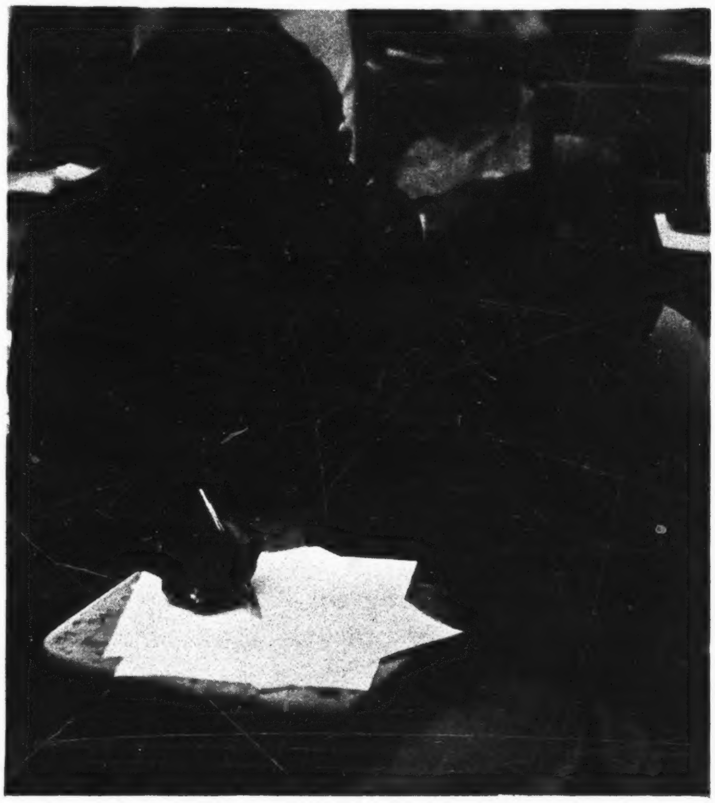
A. Musical Styles: Since music is a more familiar medium, the students will probably move more easily toward the concept of style if you begin with the three differing musical styles. Without introduction or explanation, play for the students the tape recordings of the three jazz versions of "Sweet Sue." After each version, allow them to discuss fully what they have heard, making comparisons of the versions as they are played. We have found that it is not necessary to stress technical terms in the discussion; the important thing is for the students to note the differences among these various styles in jazz and to describe these differences in their own words. Some of their comments may seem inconsequential at the moment, but later in the discussion they may play a significant role.

If you play the Dixieland version first, as we usually do, the students may not catch the tune, and may think it is "confused," "not definite." As you move into the other versions, however, they should be able to detect that each is handled differently even if the melody still eludes them. At some point, someone may notice that all three are versions of the same song. Even so, the tape recordings should be played straight through again so that the other students may discover this similarity. It might help the class if the student who has caught the tune can be encouraged to sing, hum, or whistle it. With the melody in mind, all of the students should find it easily in all three versions. Occasionally, however, none of the students may recognize the song or even realize that the same tune is being played. In some classes, we have found that this does not present a problem, as the students nevertheless notice that the ways of playing are different. When this failure to recognize the song or similarity of tune has seemed to hinder the class, we called the tune to their attention in the more melodious Swing version, and had them look for it in the others.

Once the students have discovered the similarity of tune, they should be allowed to explore more deeply their reactions to the versions and what they have observed about each. It will help them to reach some conclusions about the jazz styles if you list their comments on the board under the appropriate version (e.g., I—"1920 music" "confused" "not definite"; II—"1930's" "even-tempo" "arranged" "logical"; III—"1950's" "meditative" "abstract"). Most likely, they will be able to conclude that the same melody is being played in different ways—each way special and unique. *If necessary,* help them toward a conclusion with hints, suggestions, and questions. Probably, the word *style* will come up eventually as a sort of summarizing noun for the diverse comments they have made about era, instruments, rhythm, tempo, total effect. When they do reach some tentative idea of style in this musical context—even if the term itself is never used—they are ready to move on.

B. Painting Styles: With the students' comments about the jazz versions still on the board, place the three paintings side by side for the class to study. All of the students should immediately recognize the violin in the three paintings, and as they discuss their reactions to the paintings, references to their previous reactions to the jazz versions should come easily. Some of the students will have little difficulty in seeing the relationship between their conclusions about the jazz pieces and the three paintings of the violin. Their comments should help the others to see that each painting uses the violin in a different way just as each jazz selection used "Sweet Sue" differently. Sometimes, however, you may find that some students will react to the color stimuli in the paintings without sufficiently noticing the similarity of subject. In such cases, we have successfully overcome that problem by having the students give a literal description of the paintings.

As class discussion continues, some conclusions will be reached about the relationship between what was done in music and in painting. By then the term *style* will probably be used frequently, with some insight, hopefully, into its meaning and complexity. Once the students reveal such insight, with or without using the term *style,* they are ready to consider style in language. . . .



The Structure of Learning

Through innovations—not so much in* what *is done as in* how *it is done—learning becomes an exciting and pleasurable challenge to the students. . . .

Our central focus in the Pre-College Program is on providing each student with maximum opportunity for becoming personally involved in learning, and for developing and following his own path. To attain these ends, we have divested our Program of some traditional rules and practices and have instituted in their stead a new structure of learning. This new structure is not limited entirely to experiences in the classroom. New patterns of intellectual discourse and interaction among teachers, students, and visitors to the Centers, in the classroom and outside, create a broad social context for reinforcing the students' emerging positive attitudes toward learning.

New Rules for an Old Game In the Center classes, we have eliminated examinations, grades, syllabi, and detailed lesson plans, primarily because such devices tend to foster circumscribed learning situations. Instead, we wish to provide the kinds of situations in which the teacher and the students are free to move in whatever paths the students' learning patterns dictate, and in which each student's process of thinking or problem-solving is of far greater importance than the specific conclusions or answers he reaches. We have chosen, therefore, as our basic method of teaching, a non-directive, inductive approach which consists of Socratic dialogue and open discussion, and which places emphasis on student participation and independent discovery, and on the type of exploration and inventiveness that Jerome Bruner calls "left-handed" activities (in *On Knowing: Essays for the Left Hand*). The student is encouraged to take the initiative in his classwork, to learn how to compete with himself, and to find both his own questions and his own answers. The climate thus created is conducive to intellectual awakening for the students and, at the same time, to professional stimulation for the teacher.

The Teacher and the Program Any changes in educational philosophy or practices must be reflected in the attitudes and methods of the teacher. The kind of teacher that we recruit, therefore, is as important for promoting the desired learning situations as are the principles that we follow. For this reason, the teacher in the Program is selected not only for his academic background, but for his warmth and sensitivity to students' needs, his creativity and special talents that can be brought to bear on the materials, and his willingness and flexibility in adjusting to new conditions in the classroom.

The Program relies heavily on the personal and professional qualities that the teacher brings to the classroom. The freedom granted him in his classes entails great responsibilities. Since he cannot "prepare" in detail for any given class beforehand, he has to be perpetually alert—to work on the spot with student responses that simply could not have been anticipated. He has to be able to refrain from assuming an intellectually authoritative role, and, instead, to strike a suitable balance between leading and following class discussions: in some situations he has to be an energetic source of provocative, probing questions; in others, he has to step back, restrain himself, and let the students question and discuss freely. It is also his task to encourage the students to rely mainly upon their own discoveries; to let them assume as much responsibility for their own education as they can; and to help them develop a firmly-based intellectual self-confidence.

In handling the new materials in the Center classes, the teacher accepts a unique responsibility. He keeps a diary on the effectiveness of the various units, notes where improvements are needed, and records any particularly successful development that has taken place in his class, either with the suggested materials or with his own. By so doing, he performs an indispensable role in helping to revise materials or in bringing new ones into being from his direct and continuing experiences in the classroom. As a result, the Program profits immensely from his contributions.

The teacher, in turn, profits from being a part of the Program, since he is free to develop and refine some of his own ideas that are in keeping with its basic philosophy. He also takes back to his high school or college classes any new attitudes and methods, fresh convictions, and experimental materials that he has developed and tested while teaching at the Pre-College Center. Through the reciprocal benefits that the teacher and the Program receive, both grow more effective, and the results of this growth are felt in the double impact of innovation both on the students and the teacher, and through them, on their subsequent educational environments.

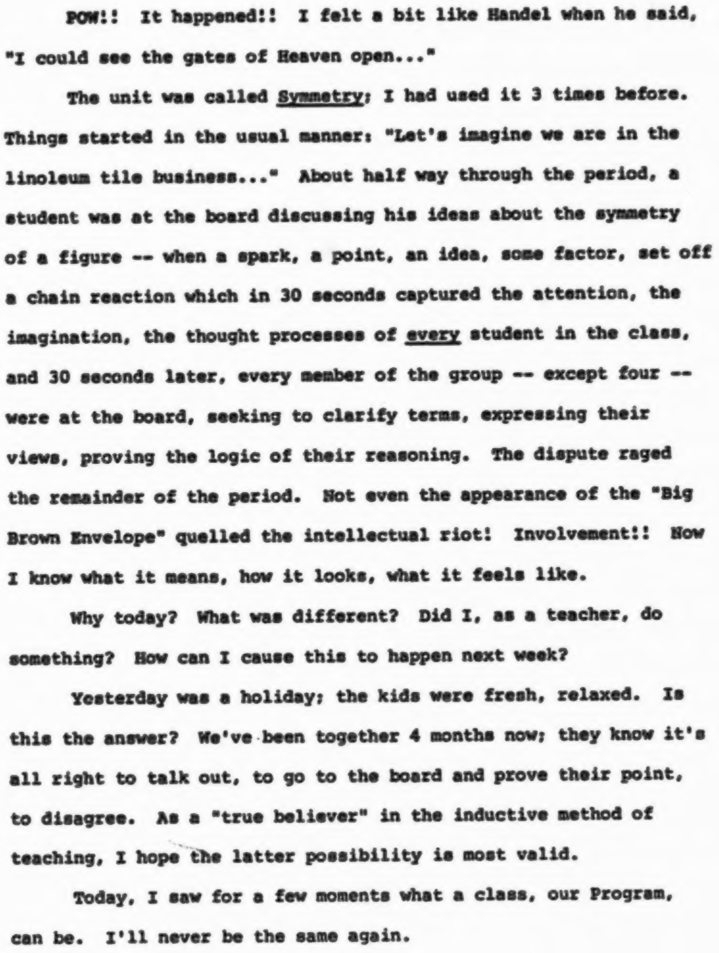
Students Helping Students The social environment we envisioned for the Program's learning experiences required more than students and teachers; a liaison was needed to bridge the gap of age and experience that separates a teacher, no matter how warm and sympathetic, from the students. Therefore, a corps of articulate and personable undergraduate and graduate students was recruited from the colleges in the local communities, to serve as program assistants. We did not intend these older students to be tutors. They were, rather, to act as models and guides, leading the younger students through the necessary adjustments to their new experiences, encouraging them to air their problems and to learn how to deal constructively with them.

The program assistants work closely with the teachers and counselors in planning vocational and educational guidance programs for the students. They also work with the students in organizing field trips to various government and industrial establishments; workshops in folk music, dancing, arts and crafts, debating; and cultural activities, such as attending concerts and plays, and visiting art museums.

Since each program assistant works with no more than ten students, he is able to give them personal attention and concentrate on the productive qualities of the interpersonal encounter. The genuine interest and warm friendship that the program assistants offer the young students can ease the social and intellectual transition that the students face in moving from their often bleak environments into the more promising world of college.

Afternoon Program The unique learning situations that we offer the Pre-College students in their morning English and math classes will only be sufficient to our purposes if the students also have opportunities to apply and extend their new knowledge, to pursue in greater depth the problems and ideas raised in class, and to discover and develop

Facsimile of a report from a Center teacher:



POW!! It happened!! I felt a bit like Handel when he said, "I could see the gates of Heaven open..."

The unit was called Symmetry; I had used it 3 times before. Things started in the usual manner: "Let's imagine we are in the linoleum tile business..." About half way through the period, a student was at the board discussing his ideas about the symmetry of a figure -- when a spark, a point, an idea, some factor, set off a chain reaction which in 30 seconds captured the attention, the imagination, the thought processes of every student in the class, and 30 seconds later, every member of the group -- except four -- were at the board, seeking to clarify terms, expressing their views, proving the logic of their reasoning. The dispute raged the remainder of the period. Not even the appearance of the "Big Brown Envelope" quelled the intellectual riot! Involvement!! Now I know what it means, how it looks, what it feels like.

Why today? What was different? Did I, as a teacher, do something? How can I cause this to happen next week?

Yesterday was a holiday; the kids were fresh, relaxed. Is this the answer? We've been together 4 months now; they know it's all right to talk out, to go to the board and prove their point, to disagree. As a "true believer" in the inductive method of teaching, I hope the latter possibility is most valid.

Today, I saw for a few moments what a class, our Program, can be. I'll never be the same again.

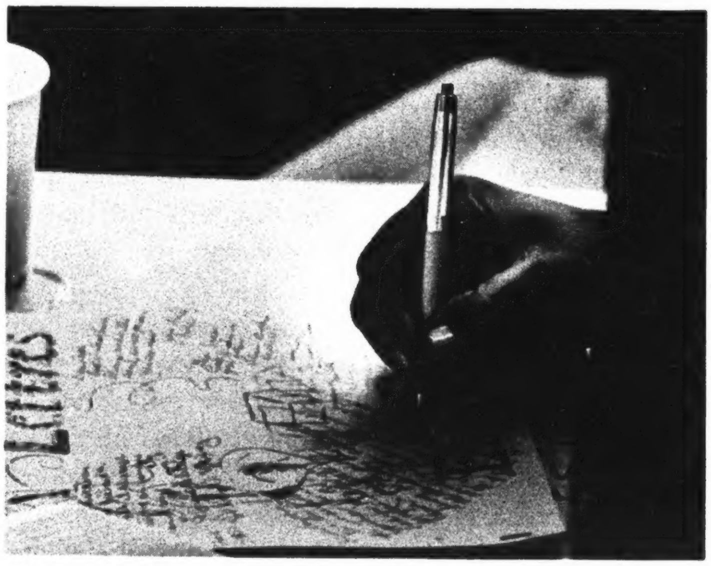
their own talents, interests, and abilities. We attempt, therefore, to make such opportunities available to them in the variety of educational, cultural, and recreational activities that comprise the afternoon program.

Some of these activities are arranged in advance by special consultants, and are offered at all of the Centers. For the film workshop, for example, a group of specialists in film education prepared the guidelines for a program in which the students themselves undertake all the steps leading to the creation of a finished film: choosing an original story line, acting, directing, shooting, and editing. The students receive advice and guidance from a specialist in residence at each Center, but they are given complete freedom to plan and execute their film. This freedom of choice stimulated a range of student effort last year. Some students attempted documentary films, drawing the subjects from their own experiences; others explored more experimental techniques; and one group devoted their attention to making an animated cartoon.

Other afternoon workshops grow out of the particular interests and talents of students at a particular Center. Music, art, drama, creative writing workshops were arranged at each Center at the request of the students. An electronics workshop was set up at one Center in response to the students' interest in a math unit on "Switches and Batteries"; at another, a workshop in contemporary religions was formed as a result of a provocative English class discussion on Dostoevsky's *Crime and Punishment* and Shirley Jackson's "The Lottery."

In addition, each Center offers its own unique activities, made possible by its specific locale. The terrain at one place supplied the requisites for forming a cave explorers' club. In other places, the cooperation of businesses and industries allowed the students to form computer programming workshops. At all Centers, the staff and students plan together to exploit to the fullest whatever resources their local communities offer.

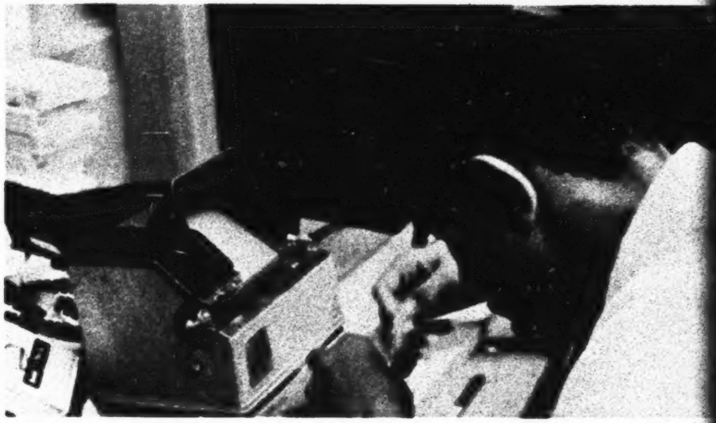
By taking advantage not only of the community resources, but also of the talents and skills available among the staff, students, and visitors, we are able to offer the students at each Center a wide range of meaningful afternoon and evening activities.



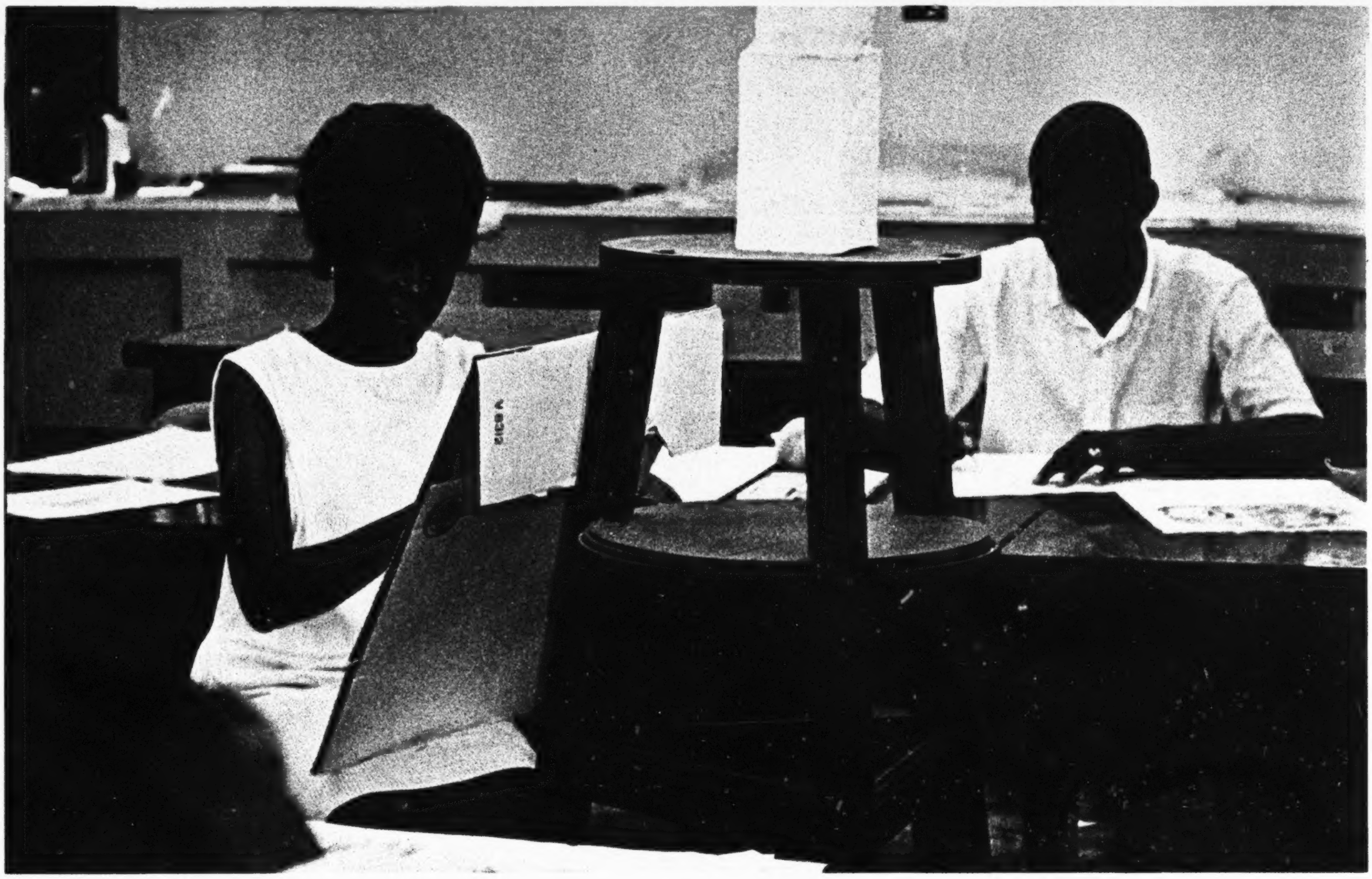
A Sampling of Student Activities

Students at each Center are offered a diversity of afternoon workshops and special classes from which to choose.

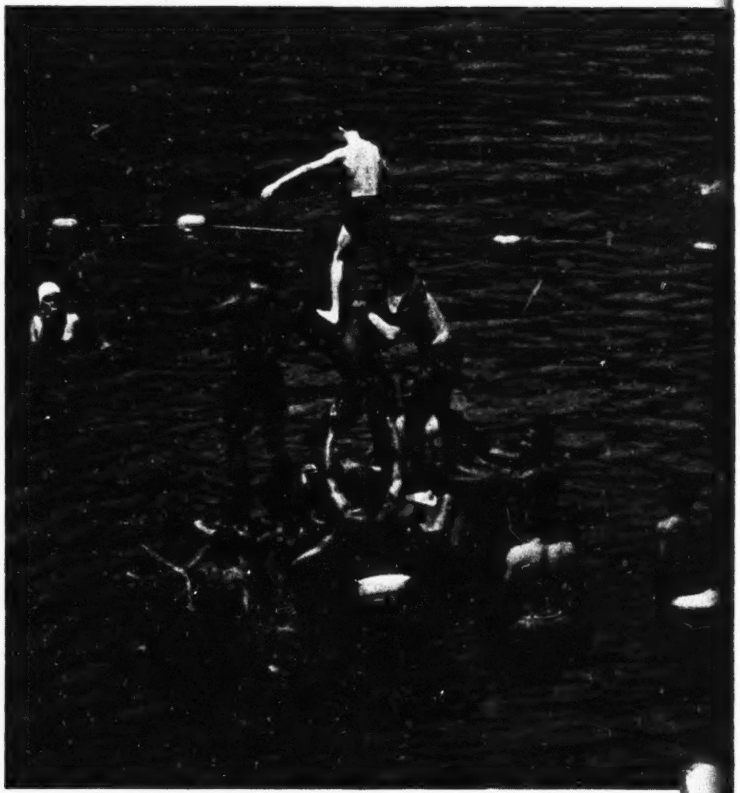
Some go "on location" with their advisers . . . to direct and shoot their first film. . . .



. . . or to enter the exciting new world of cave exploring.



Others prefer a workshop in drawing . . . . . . or a swimming class.



Sometimes students initiate their own workshops and activities

Young poets start a workshop in free verse and haiku . . .

ON WAR

Wash your hands, War.
They're dirty. You torment, you bleed, you reek of
The pains and cries of a million forgotten men.
You dance and kick and throw your head with glee. Voom!
You're not so grand—no, not at all.

Wash your hands, War.
Don't they bother you? Can you bear to look and touch
Them day after day? I could not, I would not—not if I
Were you.

I'm told that you do some good for the world. They say
You make men of mice; they say you strengthen, unite,
Arouse the cause for protection of a common right.
Maybe you do.
But you take young husbands from their wives and babes
Never to return again.
You summon the best we have to offer, promising perhaps
To soon return.
They seldom do.
You caused to be destroyed arts and wonders of centuries'
Sweat. Long, tortuous hours of creation and agony mean
Nothing to you. You tear them to whorled shreds within
The wink of an eye.

Have you a mirror, War?
Do you look into it each day? See you the once starry-
Eyed maiden whose lover you took away? See you the graying
Old mother who wrings her hands, rocks, rocks, and prays
That she may see her son in her old age? See you the
Dying babe whose eyes roll around in their sockets and
Whose tiny stomach contracts and rumbles with pangs of
Hunger? His wretched mother lies beside him. Her
Milkless breasts heave with discontent; she dies, her
Child dies. War, see you all of this?

Wash your hands, War.
Oh, how great the effort to get them clean.
Wash for eternity. Wash with all the soaps and waters
Of ages to come! You fail!
You'll never get them clean, War—no, not now, or ever
Or even after that. You'll never—your effort's
Wasted, War.

—Crystal Kilgore, Summer 1965

THE SEA

Endless waters
Infinite; ever changing
Roaming forever in your generous confines.

Stretching, as a restless child does after sleep
Aware of your potential power;
Ancient mystery.

Turbulent waters
Raging like a madman in his cell
Raising mighty arms in restless defiance.

Curling against rocks
Spitting profanely at the sky
Beating on the shores in time-old rhythm.

Gentle waters
That shyly approach the brown beach
As a young, timid animal
Approaches the outstretched hand of a stranger
Only to quickly retreat.
—Dorothy Roper, Summer 1965

Through the high-thick grass
That nature has provided
The meadowlark scampers.
—Timothy Elliott, Summer 1965

Walking along the lake
Angry at my sister
I felt a warm breeze.
—Philip Sears, Summer 1965

While an English class plans a field trip

> *"Ever since I started school, someone has been telling me what's good for me to read. I don't think we'll ever get around to what I want to read."*

This comment by a student led to the planning of a special afternoon activity: a trip to a local bookstore. As preparation for the trip, an English class period was devoted to the discussion of possible selections, and it was decided that each student would pick out the one book he particularly wanted to read. The teacher made arrangements with the owner of the bookstore to have the bill for the books sent to the Center.

Afterwards, one student chose to write about her trip:

> *"This day was somewhat different from other summer school days. . . On this day, my English class was going to the bookstore. We each received the English 'Models for Descriptive Writing,' and we discussed brief excerpts in class.*
>
> *"In the discussion, everyone talked and participated as if they each had their own favorite author. Each of us wanted everyone to know his or her author's name. It was felt by all that we could go and make a good selection without much, or should I say any, difficulties.*
>
> *"After entering the bookstore, some of us felt as if we were in the largest bakery in the world, where the world's finest goodies would be gotten; but we would only have one choice. It was humorous to me because everyone got a book whose author was different from their original choice."*

The trip was the exciting topic in many of the students' remarks:

> *"This is the first time I have ever had an opportunity to go to a bookstore and select a book for my very own. I was so excited I had trouble making up my mind."*
>
> *"You didn't feel pushed. You could relax, smile, and enjoy reading."*
>
> *"I was glad we didn't have to write a written report on it. I would have selected a book of about 60 pages if we did."*
>
> *"I enjoyed the way we went. We were on our own. We had to select something meaningful to us. I felt like an adult."*

> *"Man, nobody has to translate this book [by James Baldwin] for me. I know what that cat's saying. That's just like my house on a holiday: everybody sitting around, talking, doing nothing."*

The owner of the bookstore also shared their enthusiasm:

> *"You know, I didn't realize it before, but these kids are selecting books like all the adults that come in here. I don't know of any better way to become involved with a book than through self-selection."*

Here are the titles of some of the books the students chose:

THE GREAT GATSBY
THE SUN ALSO RISES
A RAISIN IN THE SUN
THE BROTHERS KARAMAZOV
THE FIRE NEXT TIME
THE UGLY AMERICAN
JOY IN THE MORNING
TO KILL A MOCKINGBIRD
RAISE HIGH THE ROOFBEAMS, CARPENTERS

Teachers also arrange special activities for the students

On February 5, fifteen of us spent an afternoon in the shop of Mr. Bob Westervelt, well-known Atlanta-area sculptor. Mr. Westervelt, who is both an exhibiting artist and a member of the art faculty of Agnes Scott College, seemed to fall intuitively into the ESI spirit: after a short demonstration, during which he "threw" a large bowl and a vase on his potter's wheel, he invited the daring members of the group to try their hand at it. Within minutes everyone was elbow-deep in wet clay, and six potter's wheels were in motion. Mr. Westervelt's cautionary advice that we not make anything so good that we would hate to part with it was probably unnecessary, given the results of our "throwing", although some latent talent shone through in places.

Both Mr. Westervelt and his wife, Pat, worked with us, suggesting ways by which we could improve our work. We learned a good bit about the use of the potter's wheel, and discovered the difficulties inherent in the whole process.

Following an hour-and-a-half spent working in the shop, we were invited to examine the "functional" pottery work in the Westervelt home. These pieces included lamps, plates and bowls, statuary, and even framed ceramic-type wall hangings. We found the Westervelts to be both gracious hosts and excellent instructors.

The high point of the visit was, of course, the opportunity to actually work in the artist's medium.

An Informal Evaluation

Former Pre-College Students reflect on the Program . . .

At an orientation meeting in February 1966, three freshmen from Howard University and one from Bethune-Cookman College—all former students of the Howard Pre-College Center—discussed their impressions of the Program:*

Iris: Referring to the question about the Pre-College Center and what we got out of it, it was sort of like a revelation. I mean, you know for once in your life that there is something that you can think about on your own, and you know that you are capable of doing this. So if you have to go back to the same old routine, at least you'll know that the other exists. And I think that is one of the most important things, whether you get an instructor [in college] that lets you say more or less what you want to or not, you know that *that* was there, and that for a time you had it. And you know that it exists.

Earl: . . . Being in the Pre-College Center, I developed new interests. Before, I *thought* I was interested in art and music and literature and things of this nature. But being in the Pre-College Center helped to show me how ignorant I was of what art really was, and what *was* in English,—[things] that I was overlooking. Before, I would just go to an art gallery and look at a painting by Van Gogh, and I would probably even say, "That's beautiful," or something like that. . . . But the teacher [in the Center] brought out how we're supposed to look for detail, and how you're supposed to look for the painter's style, and also look for unusual types of expression and movement in writing, and things of that nature—also in music—and in drama. I enjoyed looking for details, greatly, because we tore apart different excerpts from writers, and it helped me to see through a person's written piece of work—it helped me to see the thing as more than just a passage of words; but to see a main idea, and a series of details, integrating or building up this main idea, adding to it, forming it. And it has helped me to organize my thinking, and channel my way of thinking—it has helped me to think intelligently.

Charles: You go through twelve years of high school, and teachers tell you, "Write a paper on so-and-so." It's boring. But in this Program, the teachers told you to write on what you thought best, or what you were best fitted to write on. I never thought that I could write a paper as good as some of these—well, *I* thought they were good, anyway. And [my teacher] helped me a lot by not grading my papers; she just circled my errors, and every evening I'd go and pick up a dictionary, and straighten them out. So it made me feel good. And the math—I'm never very good in math, and I always run away from it. But the math was enjoyable, because every day the teacher would say, "Well, wouldn't you like to work on this today?" or "Does this problem work for you?" No, the problem didn't work for *me*, but every evening I'd try the problem out a little more, and it would help. So the Program helped me in a lot of ways.

Earl: . . . After I completed the course, I thought to myself that the theme of the course—if I were to write on it—I would call it a thinking course. To me it came as though at the time I was really thinking, and it—not directly "taught" you—but it gave you a perpetual method of thinking. I think a person would profit from taking this course, more so than taking a course in, say, history, because he may forget a lot of dates and things that he learns in history, but you don't forget how to think in a certain pattern. It's something that just grows on you, and that's what happened to me at the Pre-College Center. . . . In college, when you come up against a problem, it helps you not to just try it a couple of ways and then give up, but it helps me to keep thinking of different channels, or ways to solve the problem.

---

* Transcribed from a tape recording.

A Systematic Evaluation

A team of behavioral scientists outlines plans for an appraisal of the Pre-College Program . . .

Although the gathering of impressions from teachers, program assistants, students, and visitors at the Centers on the strengths and weaknesses of the Program is of considerable value in making an informal assessment of its impact, this is by no means a sufficient basis for judging the success and effectiveness of the Pre-College Program. Objective data, systematically collected and competently analyzed, must be the primary foundation of a valid appraisal.

A group of educators has been serving as an advisory committee* to determine a just system of evaluation, to select two behavioral scientists to establish and implement the research program, and to provide counsel for these researchers as needed. These two staff members are now working closely with the Center personnel in collecting the pertinent data and directing the follow-up studies that are necessary for the evaluation.

The research staff, with the counsel of the advisory committee, has decided upon two basic aims for the evaluation study:

1. to identify the special features of the Program which should be continued, and those which require modification;
2. to determine whether the Program as a whole has a long-term effect upon the students' education and vocational choices and achievements.

To attain the first goal of the study, the research staff proposes:

a. to conduct intensive interviews with Pre-College Program students in order to determine which aspects of the experience they perceive to be most helpful;

b. to compare and contrast student reactions to the Program at each of the six Centers.

To meet the second objective of the research plan, a four-year follow-up study is projected. The researchers intend:

c. to select a matched group of students who are similar in educational attainments and socio-economic status, but who did not attend one of the Pre-College Centers;

d. to compare the Pre-College students and the controls on the objective measures of academic progress, such as percentages entering and graduating from college, and the level of performance while in college;

e. to compare attitudinal changes of the Pre-College students with the control students, by testing each group before, immediately after, and a number of years after the Pre-College experience. Particular emphasis will be placed on the attitudes of the students toward themselves, their futures, and the value they assign to education.

From the results of the comparisons of both objective and attitudinal data from the Center participants and the matched non-participants, conclusions will be reached concerning the efficacy of the Pre-College experience in promoting the growth of a more positive self-image, raising the student's level of aspiration, and motivating him to work to the best of his ability in obtaining a college education.

---

*Members of the Research Advisory Committee are listed on page 40.

Sample Data on Pre-College Students

Sample
FAMILY INCOME STATISTICS OF PARTICIPANTS IN ONE PRE-COLLEGE CENTER

(Dillard Pre-College Program, Summer 1965)

NUMBER OF CHILDREN IN FAMILY	TOTAL IN GROUP	AVERAGE INCOME PER FAMILY	PERCENT OF TOTAL PARTICIPANTS
1	23	$2,788.30	13.7%
2	26	$3,148.58	15.4%
3	30	$3,594.95	17.9%
4	30	$3,857.17	17.9%
5	21	$4,238.71	12.5%
6	7	$4,688.00	4.2%
7	14	$3,432.43	8.3%
8	7	$4,709.57	4.2%
9	5	$4,861.40	3.0%
10	2	$4,075.00	1.2%
11	2	$3,874.00	1.2%
12	1	$1,280.00	.5%
1–12	168		100.0%

CURRENT COLLEGE ENROLLMENT OF SUMMER 1965 PRE-COLLEGE ALUMNI

ENROLLMENT	DILLARD	FISK	HOWARD	MOREHOUSE	TEXAS SOUTHERN	WEBSTER	ALL CENTERS
Local Colleges	114	114	104	101	116	58	607
Out-of-City Colleges	29	10	26	21	44	24	154
Total Enrollment All Colleges	143 (85%)	124 (78%)	130 (79%)	122 (71%)	160 (83%)	82* (88%)	761 (80%)
Not Enrolled	25	23	20	46	11	9	134
No Information	0	11	15	4	21	2	53
Total Number of Students	168	158	165	172	192	93*	948

---

*This figure excludes the 50 juniors in the Webster Pre-College Program, Spring-Summer, 1965

Persons Associated with the Program for Pre-College Centers

Administration
Herman Branson, *Director*
Emily Morrison, *Associate Director*
Judith Andrews, *Program Manager*
Carolyn Fitchett, *Program Coordinator*
Lometor Pinnick, *Administrative Secretary*
Elizabeth Daniels, *Secretary-typist*

Curriculum Resources Group

ENGLISH
Arthur Davis and Lawrence Langer, *Editors*
Joan Murrell, *Resident Editor*
Carolyn Feshbach, *Editorial Assistant*

MATHEMATICS
W. L. Barclay and W. J. Nicholson, *Editors*
Donna Doyle, *Resident Editor*
Forrest Priddy, *Editorial Assistant*

Research and Evaluation Group
Paul Daniel Shea, *Director*
Victoria Steinitz, *Research Associate*
Naomi Cherkofsky, *Secretary*

Consultants on Preparation of Materials
(Wheelock College, Summer 1965)
Irving Adler, *Author and lecturer*
North Bennington, Vermont

John Alexander, *Department of Mathematics*
Boston State College

Lettie J. Austin, *Department of English*
Howard University

William L. Barclay, III
Commonwealth School and Urban School
Boston, Massachusetts

Alan Blackmer, *Dean of Faculty, Phillips Academy*
Andover, Massachusetts

Herman Branson, *Head, Department of Physics*
Howard University

Edward Carroll, *Department of Mathematics*
Public Schools, Englewood, New Jersey

Robert Christin, *Department of English*
University of Notre Dame

Arthur Davis, *Department of English*
Howard University

Donna Doyle
Educational Services Incorporated

Jean Ferris, *Department of Mathematics*
University of Colorado

Carolyn Fitchett
Educational Services Incorporated

Newcomb Greenleaf, *Department of Mathematics*
University of Rochester

John Holt
Commonwealth School and Urban School
Boston, Massachusetts

Phyllis Klein
University of Illinois Arithmetic Project
Educational Services Incorporated

Lawrence Langer, *Department of English*
Simmons College

Philip Morrison, *Department of Physics*
Massachusetts Institute of Technology

Joan Murrell
Educational Services Incorporated

William J. Nicholson
IBM Watson Laboratories
New York City

Douglas O'Connor, *Writer*
New York City

Lee Osburn
University of Illinois Arithmetic Project
Educational Services Incorporated

Alfred G. Redfield
IBM Watson Laboratories
New York City

Walter Talbot, *Chairman, Department of Mathematics*
Morgan State College

Lawana Trout, *Department of English*
Central State College, Oklahoma

Marcia Watson, *Department of English*
Volusia County Junior College, Florida

Research Advisory Committee

James A. Bayton, *Department of Psychology*
Howard University

Alan Blackmer, *Dean of Faculty*
Phillips Academy

Leonard Fein, *Department of Political Science*
Massachusetts Institute of Technology

Bernard Harleston, *Department of Psychology*
Tufts University

David Hawkins, *Department of Philosophy*
University of Colorado

Martin Jenkins, *President*
Morgan State College

Evan Keisler, *Department of Education*
University of California

Gardner Quarton, M.D., *Department of Psychiatric Research*
Massachusetts General Hospital

EX OFFICIO:
Herman Branson, *Head, Department of Physics*
Howard University

Philip Morrison, *Department of Physics*
Massachusetts Institute of Technology

Jerrold R. Zacharias, *Department of Physics*
Massachusetts Institute of Technology

Ad Hoc Committee of the American Council on Education

(In 1964, when Program was instituted)
Herman R. Branson
Howard University
Committee Secretary

Roger W. Heyns, *Vice-President for Academic Affairs (in 1964)*
University of Michigan

Martin D. Jenkins, *President*
Morgan State College

Samuel M. Nabrit, *President*
Texas Southern University

Samuel Proctor, *President (in 1964)*
North Carolina A. & T. College

Mina Rees, *Dean of Graduate Studies*
City University of New York
Committee Chairman

John C. Warner, *President*
Carnegie Institute of Technology

Stephen Wright, *President*
Fisk University

Jerrold R. Zacharias
Massachusetts Institute of Technology

To Gladly Learn

The Program for Pre-College Centers

Supported by

The Carnegie Corporation of New York
and the Office of Economic Opportunity

Program Director:
Dr. Herman R. Branson
Howard University
Washington, D.C.

DILLARD UNIVERSITY
Dillard Pre-College Center
New Orleans, Louisiana
Director: Miss Adrienne C. Tervalon

FISK UNIVERSITY
Fisk Pre-College Center
Nashville, Tennessee
Director: Dr. Stanley I. Alprin

HOWARD UNIVERSITY
Howard Pre-College Center
Washington, D.C.
Director: Mr. Conrad D. Snowden

MOREHOUSE COLLEGE
Morehouse Pre-College Center
Atlanta, Georgia
Director: Dr. Arthur C. Banks, Jr.

TEXAS SOUTHERN UNIVERSITY
Texas Southern Pre-College Center
Houston, Texas
Director: Mr. William A. Lawson

WEBSTER COLLEGE
Webster Pre-College Center
St. Louis, Missouri
Director: Sister Marie Francis Kenoyer

EDUCATIONAL SERVICES INCORPORATED
PROGRAM FOR PRE-COLLEGE CENTERS
Curriculum Resources Group and
Research and Evaluation Group
55 Chapel Street, Newton, Massachusetts

BR-6-1700
PA-24

ED015177

Summary of Final Report
May 31, 1967
Office of Education
Contract No. DEC-1-6-061700-1735
Educational Services Incorporated
Curriculum Resources Group

TE 000 071

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

TE 000 071

Educational Services Incorporated
Curriculum Resources Group
55 Chapel Street
Newton, Massachusetts 02160

Office of Education
Contract No. OEC-1-6-061700-1735

SUMMARY OF FINAL REPORT

MAY 31, 1967

Summer Writing Conference to continue development of materials in expression of ideas (English) and quantitative thinking (Mathematics) to be used in Pre-College Centers for Students from Low-Income Families.

Educational Services Incorporated
Curriculum Resources Group
55 Chapel Street
Newton, Massachusetts 02160

Office of Education
Contract No. OEC-1-6-061700-1735

SUMMARY OF FINAL REPORT

MAY 31, 1967

Summer Writing Conference to continue development of materials in expression of ideas (English) and quantitative thinking (Mathematics) to be used in Pre-College Centers for Students from Low-Income Families

I. Introduction

A summer writing conference to continue development of materials in expression of ideas (English) and quantitative thinking (Mathematics) to be used in Pre-College Centers for Students from Low-Income families was held on the Pine Manor Junior College campus in Chestnut Hill, Massachusetts during the summer of 1966. The conference was supported by a grant from the Office of Education, and administered by Educational Services Incorporated. The eight-week writing conference brought together 28 teachers, writers, mathematicians and scientists from high schools and universities in ten states. The final one-week teachers' workshop was attended by 33 teachers from eight Upward Bound centers which had used the curriculum materials earlier in the summer.

The writer-participants spent the summer revising and evaluating existing units, and developing new units in the broad areas of English, mathematics and natural science. English was interpreted to include anything that would encourage the expression of ideas--in writing, thinking or speaking. Materials included art and music and film and history as well as literature, reading and speech. Similarly mathematics was considered to be anything that would encourage quantitative thinking and logical inquiry. A start was also made in developing units in the biological and physical sciences.

Some of the new units were sent to selected teachers at the centers early in the fall, and on the basis of feedback from them, staff members and some of the participants were able to prepare units for use at centers during the 1967 summer program. Therefore an amendment was requested and granted extending the expiration date of the contract from December 31 to May 31 to allow continuation of editing and revision and reproduction of these materials.

II. Background of Project

The Pre-College Program for Students from Low-Income Families was conceived during the spring of 1964 as part of an effort to strengthen and improve the predominantly Negro colleges by helping to decrease their very large (approximately 70%) dropout rate. Six centers were established at Dillard University (New Orleans), Fisk University (Nashville), Howard University (Washington), Morehouse College (Atlanta), Texas Southern University (Houston), and Webster College (St. Louis) and began Saturday classes in March 1965, with financial support from the Carnegie Corporation of New York. Beginning in June 1965, support for the six pre-college centers was assumed by the Office of Economic Opportunity under its Upward Bound program.

Conferences for the preparation of materials were held by the Curriculum Resources Group during the summers of 1964 and 1965 with teachers from high schools and colleges gathered together to develop a program for high-school students from low-income families to enhance the probability of their entering college and of their finding college interesting, provocative and worthy of great effort. The activities of the Curriculum Resources Group have been financed by a grant from the Carnegie Corporation of New York from September 1, 1964 until May 31, 1967.

III. General Aims

The English and Mathematics groups had as broad aims for the summer 1966 writing conference the continued preparation of individual units in writing, speech, reading and history, as well as literature, and in natural science as well as mathematics; the development of experimental sequences of several units; and the extension of the materials.

The group was convinced from the beginning that a remedial program was not the solution. Although some of the subject matter is conventional, the way in which it is presented is not at all so. In this program our objectives for students are primarily the development of habits of inquiry, of attitudes and values, and secondarily the acquisition of knowledge. Our aim has been to design a body of material that teachers can use to create an open and more flexible classroom situation. The units take conventional topics and place them within a frame of reference that will naturally demonstrate their relevance. We feel that crucial to educating the student is allowing him to discover by what appears to be his own effort that certain heretofore "academic", and therefore apparently remote and irrelevant, topics are indeed important because they vitally influence his existence or describe forces that influence his existence.

IV. Lists of Participants and Visitors

A. Participants in Eight-Week Writing Conference

Irving Adler, author and lecturer (Math); July 5-15

John Alexander, Boston State College (Math); June 20 - August 19

William L. Barclay III, Commonwealth School (Science); June 20 - July 29

William T. Brown, Howard University (English); June 20 - August 12

Jeffrey Camhi, Harvard University (Science); June 20 - August 12

Maxine Daly, Cardozo High School (English); July 5 - July 22

Arthur Davis, Howard University (English); June 20 - August 19

Lee Evans, Newton Public Schools (Math); June 20 - August 19

Ann Flagg, Cook County Public Schools (English); June 27 - August 12

Sister Josette Ford, Webster College (English); June 20 - August 12

Marvin Fridley, St. Louis Public Schools (Science); June 20 - August 12

Norman Friedman, Queens College (English); June 20 - August 12

Leroy Giles, Howard University (English); June 20 - July 29

Newcomb Greenleaf, U. of Rochester (Math); June 20 - July 15

Peter Hilton, Cornell University (Math); August 1 - August 5

Jonanthan Kozol, writer (English); June 20 - August 12

Lawrence Langer, Simmons College (English); June 20 - August 12

Dane Morgan, Commonwealth School (Science); June 20 - August 12

Sandra Pearson, Newton Public Schools (Speech); June 27 - July 15

Davenport Plumer, Harvard University (Reading); July 14 - July 19

David Pradell, Brookline Public Schools (Science); June 20 - August 12

Roberta Rabinoff, Cardozo High School (English); June 20 - August 12

John Rier, Howard University (Science); June 27 - July 29

David Seligson, Duke University (Science); June 27 - August 19

Conrad Snowden, Howard University (English); July 5 - August 19

Robert Solem, Dillard University (English); June 27 - August 5

Walter Talbot, Morgan State University (Math); August 1 - August 19

Mary Wilburn, Cardinal Cushing College (English); June 27 - August 12

B. Visitors and Consultants

Robert Greene, U.C.L.A. (Math)

John Hawkes, Brown University (English)

Charles Haynie, Cornell University (Math)

Phyllis Klein, Illinois Arithmetic Project (Math)

Philip Morrison, M. I. T. (Physics)

Lee Osburn, Illinois Arithmetic Project (Math)

Alfred Redfield, IBM Watson Laboratory (Physics)

C. Participants in Teachers' Workshop

English

Teachers from Upward Bound programs using ESI material

Doris Adler, Howard University
Louis Becker, Emory
James Bishop, Morehouse College
Robert Deason, Texas Southern University
Gail Donovan, Morehouse College
Sister Alene Faul, Webster College
Betty Francis, Dillard University
Cleo Gray, Howard University
Betsy Hendricks, Fisk University
Dorothy Lawrence, Texas Southern University
Mason Lowance, Morehouse College
Cora Macdonald, Dillard University
Burton Melnick, Dillard University
Minnie Miles, Fisk University
Carol Reed, Texas Southern University
Eleanor Traylor, Howard University
Mary Walker, Fisk University
Donald Wiener, Texas Southern University

Consultants

Arthur Davis, Howard University
Davenport Plumer, Harvard University
Sandra Pearson, Newton Public Schools
Susan Thomas,

Mathematics

Teachers from Upward Bound programs using ESI material

William T. Briggs, Fisk University
Riley Elliott, Fisk University
John Ernst, Webster College

Richard Gowell, Dillard University
Alice Hankla, Morehouse College
Richard Hatfield, Fisk University
Melvin Hodges, Dillard University
Beverly Jacques, Dillard University
Frances Jeter, Fisk University
Sister John Elizabeth, Webster College
Virginia Merrill, Bowdoin College
Gladys Richardson, Morehouse College
William Riggan, Tufts University
Juanita Stiles, Howard University
Harold Tate, Texas Southern University

Consultants

John Alexander, Boston State College
Lee Evans, Newton Public Schools
Newcomb Greenleaf, University of Rochester
David Pradell, Brookline Public Schools
Walter Talbot, Morgan State University

V. Procedures

A. Eight-Week Writing Conference

The Summer writing conference held its opening session at Pine Manor Junior College in Chestnut Hill, Massachusetts on June 20, 1966. The writer-participants, who came from a wide variety of backgrounds, worked individually or in small groups and met periodically to discuss their ideas. Some of them travelled to the centers to talk with teachers, observe classes and try some of the new units being developed. The last week of the conference, August 14 - August 19, was devoted to a Teachers' Workshop with participants from those Upward Bound centers using Curriculum Resources Group materials.

B. Teachers' Workshop

An innovation introduced at this summer's conference was a one-week teachers' workshop at the end of the session.

On the basis of recommendations by center visitors, teachers who had been using our materials and who seemed to have creative ideas of their own were selected to come to Boston, where they had an opportunity to discuss their experiences in teaching the units with the editors responsible for revising and improving them. If curriculum innovation is to be successful, classroom teachers need to realize that they are as integral a part of the process as the innovators themselves. Teachers left the workshop with a clearer sense of their relationship to the people creating the units, a deeper insight into the implications of the material they were teaching, and a reinforced commitment to the methods for presenting it in the classroom. An additional asset of the workshop week was that the participating teachers were given an opportunity to write their own units; the process gave them an inside view, as it were, of the nature of innovation.

C. Continuation of Work after Summer

A small group of writer-participants continued to work on materials, either as members of the CRG permanent staff or as consultants. Some of the summer units are going to be used by second year students in the six affiliated Upward Bound centers during the summer of 1967. Work continued on both the speech and reading programs.

D. Preparation of a Unit

As an example of the effort involved in this kind of curriculum development a description of the preparation of a single unit--The Cool World--is given, including teacher feedback and student writing samples.

Most of the units in English required only small amounts of reading, but they had been successful enough so that students began to demand longer works, novels and plays. The task was to find a novel unfamiliar to teachers as well as students, and yet one which would reflect a milieu of immediate interest to the students. Cool World was chosen because the author of the unit had used it successfully in a Boston class, the novel was short, its idiom was honest, the issues explored were sufficiently universal, and the age of the characters was sufficiently close to that of the students.

The completed unit was distributed to the six Upward Bound Centers in the fall for use in Saturday programs as an initial testing. Teachers reported on the virtues and limitations of the unit, of their classroom experiences, of the student writing it inspired. A sample of such student writing is included.

ANNOTATED LIST OF ENGLISH AND MATHEMATICS UNITS

Annotated List of English Materials
Prepared During the Writing Conference

Summer 1966

COLOR ME HAPPY: COLOR IMAGERY IN LITERATURE — William T. Brown

Discussion of the varying emotions elicited by the same picture presented in black-and-white and in various color tones introduces students to literal and symbolic use of color as a means of expression and a source of significant and vivid imagery in poetry, drama, and fiction. Literary excerpts are studied to determine how color creates a setting, portrays an emotion, or contributes to the mood of an entire work. The writing assignments ask students to create their own descriptive passages using color as a form of imagery.

VOICES IN THE ARTS — Mason I. Lowance, Jr.

The intent of this unit is to show, through comparison, that a mood or feeling may be generated by words in much the same way that it is by music. Beginning with renditions of varied musical styles -- from jazz to classical -- students discuss the feelings evoked by musical sounds. They then proceed to an examination of language, applying the principles of analysis they have acquired through examining the musical works.

ON THE COOL WORLD — Jonathan Kozol

This unit focuses on a short and exciting novel of high interest to many teen-agers. The various elements at work in the novel -- the voice of the narrator, the development of characters and of plot, the use of language -- are analyzed in selected passages. The suggested writing assignment encourages students to examine closely an incident in the novel, and create and write -- in language and style of the story -- their own resolutions of the situation.

CHOICE, FATE AND OEDIPUS THE KING — Arthur P. Davis

The effects of choice and fate in Sophocles' Oedipus Rex is studied in terms of the changes in Oedipus' personality as the drama unfolds. The unit begins with an open, unstructured discussion of the contradiction between the way we *feel* about fate -- through projecting the responses of a man who misses a plane that subsequently crashes, and admissions of semi-superstitiousness with respect to horoscopes and the like -- and how we *think* about it.

intellectually, tacitly assuming that we are "masters of our fates." As students begin reading Oedipus Rex, they are asked to chart the series of seemingly disassociated events in the play (or mentioned in the play), noting how each does or does not alter the personality of Oedipus.

TRUTH VS. FICTION

Revised by Robert Solem

The purpose of this unit is to examine the ways in which a writer of fiction creates in his readers a sense of involvement in a story and an emotional response to its characters. This purpose has been made more clear-cut and accessible to students through revision and inclusion of more revealing excerpts. The class considers whether "truth" and "fiction" -- in the sense that one deals with a world of fact, and the other with a world of imagination -- are necessarily polar opposites, and explores the techniques used in writing fiction and fact.

POETIC STRUCTURE

Norman Friedman

This first unit in a series of five on poetry focuses on poetic structure, specifically, dramatic structure. Students first enact situations from their own experiences, then certain situations suggested in the unit; later, they examine these situations as they are presented in particular poems, comparing their own spontaneous versions with the more selective and "completed" versions of the poets. The purpose is to encourage students to discover that the structure of a poem is not a random affair, but rather the results of a series of purposeful choices. Students examine deliberately altered versions of one poem -- Langston Hughes' "Late Last Night" -- in order to appreciate better the poet's reasons for choosing the final form of the poem.

POETIC TECHNIQUE

Norman Friedman

The concept of order -- point of view, selection, arrangement of details -- is the focus of the second unit in the poetry series. A number of possible choices in points of view, selection, and arrangements are defined and discussed, and the appendices include examples in poems illustrating each choice. The unit explores concretely the impact of a poem of the various choices open to a poet through additional altered versions of "Late Last Night," and representative "completed " poems by other poets.

POETIC STYLE

Norman Friedman

Attention, in this unit, is centered on poetic language: diction, figures of speech, rhythm, and sound. Again, altered versions of "Late Last Night" are used, this time to illustrate both levels of diction and types of figures of speech, emphasizing the effects of such language. Metaphor, for example, is discussed first in terms of how magazine advertisements "sell" a product by means of implication and association. Rhythm patterns are introduced by way of the patterns of various dance steps, and rhyme is discussed in terms of the appeal of both regularity and irregularity in our environment. As in the preceding units, additional poems are appended for further study, and students are given a chance to write or rewrite poems of their own, illustrating the different principles of style discussed in this unit.

NON-DRAMATIC STRUCTURES IN POETRY — Norman Friedman

In this fourth unit in the poetry series, attention is shifted from lyric poems whose structure is based on the reaction of a character to a situation, to the body of lyric poems which is a poetry of statement alone. Through discussion and dramatization of suggested propositions, students derive functional definitions of non-dramatic structures in poetry, and through close analysis of selected poems, they discover characteristic techniques which distinguish this body of poetry from the reaction-to-situation poems they studied earlier in the series.

POETRY AS VISION — Norman Friedman

The final unit in the poetry series is devoted to the relationship among poetry, morality, and reality. The purpose of the unit is to show that it is the function of poetry, in one of its aspects -- in relation to the reader's life in society -- to broaden and deepen our awareness of the possibilities of life as a multi-faceted and ultimately undefinable phenomenon. The method recommended for making students aware of the relationship between poetry and reality follows three stages throughout the unit: to have students set up miniature debating teams in the classroom, to have the class discuss the results of these debates, and then to have them study a poem or group of poems dealing with the same issue.

WRITING A BOOK FOR CHILDREN — Jonathan Kozol

Based on the assumption that students might do for their younger sisters and brothers what they would not do for themselves, this unit involves the class' discussing specifically how they would draw up a book for children, a book for here and now, with local expressions, fads, place names, and familiar situations. Most important, the book would be designed to give a picture of life as students know it: if it were up to them to "educate" their brothers and sisters about "real life," what sort of things would they want to tell them, warn them about; what sorts of things, if any, would they want to protect them from, hide from them at this point in their lives. This unit also serves as an outline for a project started in class and carried through -- after class hours by those interested -- until a booklet is drawn up, complete with local pictures or illustrations.

AN HISTORICAL LOOK AT ENGLISH Sandra Pearson

This unit is concerned with the evolution of language and demonstrates how English has changed through close comparison of four different versions of the Lord's Prayer: an Old English version, a Middle English version (Wycliffe's translation of the Bible), and Elizabethan version (The King James Version), and a modern version (The Revised Standard Version). Supplements to the unit include reproductions of the older versions and recordings of them, to demonstrate both the visual and oral changes, as well as a recording of a contemporary jazz-Mass version.

JABBERWOCKY: LITERATURE AND EXPERIMENTAL LANGUAGE A. P. Davis

Beginning with a discussion of Lewis Carroll's "Jabberwocky," students examine the various ways in which writers have tried to convey a sense of reality using unconventional language, style, and form. Ultimately, students consider passages from Faulkner and Joyce and try to decide whether the experience certain modern writers are attempting to render requires the kind of experimental techniques adopted by these writers, and if so, what the relationship is between what they say and how they say it.

"WHERE DO I COME FROM? WHAT AM I? WHERE AM I GOING?" A unit in Autobiography Jonathan Kozol

In this unit on writing autobiography, students are propelled into consideration of the basic questions of identification through close examination and discussion of Gauguin's painting "D'ou Venons-Nous? Que Sommes-Nous? Ou Allons-Nous?" (Where are we from? What are we? Where are we going?). Students afterwards describe graphically, or literally draw the equivalent, of their own physical and spiritual neighborhood, discussing the reasons for including certain details and omitting others, and finally writing a series of frank and personal responses to the questions raised in Gauguin's painting.

ON THE USES AND ABUSES OF POWER Mary Wilburn

Designed to encourage students to discuss and think about the meaning of freedom, license, and limitation in any society, this unit has students enact Kenneth Brown's play The Brig on the theory that participating in the roles will provide them with a more vivid sense of the extreme use of power to restrict freedom. Students then read a passage from Rabelais which describes what might be considered a Utopia of License, whose motto is "Do what you wish." In the ensuing discussions, students are encouraged to compare the two extremes, and their effort on the humanity of the individual.

ANIMAL FABLE AND ORWELL'S ANIMAL FARM

Robert Solem

This unit explores the technique of investing animals with human characteristics and vice versa as a vehicle for commenting on the limitations and aspirations of men. Fables from Aesop and James Thurber, and Animal Farm by George Orwell are used to illustrate some of the ways the artist can use animal characters to reveal aspects of human behavior.

CONCENTRATION CAMP AND THE IDEA OF FREEDOM

Jonathan Kozol

The concept of freedom is investigated through a comparison of two classic books on confinement: Elie Wiesel's Night, on a Nazi concentration camp, and Alexander Solzhenitsyn's One Day in the Life of Ivan Denisovich, on a Russian prison camp. Specifically, students contrast the two books for their respective statements about freedom, the effects of confinement, and the spiritual triumph over -- or defeat under -- physical imprisonment.

EXPANDING THE IMAGINATION: AN ACTION APPROACH TO WRITING

Ann Flagg

The purpose of this unit is to provide students with an experiential approach to writing. This approach incorporates pantomime exercises, use of the tape recorder, and selected excerpts from various authors as devices for fostering the sorts of experiences that may result in students' writing with greater ease and effectiveness as well as reading with greater understanding and pleasure. Through pantomime, students are encouraged to stretch their imaginations and to invent and express a variety of ideas on a non-verbal level, as preparation for the writing and reading they will do later in the unit. The reading, writing, and pantomiming reinforce each other in impressing upon students the value of precise words and keen observation of detail in communciating thoughts.

ON THE CREATION OF POETRY

Robert Solem

By actually "re-constructing" a poem, students gain some insight into the relationships between the words or "raw material" of a poem and its structure and subject matter. Later, by comparing their efforts with the original and by discussing the differences between them, students gain a better understanding of the nature of poetry.

Langston Hughes' "Homecoming" is used as the model for reconstruction: its vocabulary is simple and colloquial, and the protagonist's situation and mood can be readily understood by students, and there is ample substance in the poem for worthwhile discussion.

A WRITING UNIT USING THE THEME OF DISGUISE

Roberta Rabinoff

Since many students have a need for assistance in expository writing, this unit is designed to help them in arriving at a thesis based on a given amount of material. The use of masks and disguises in modern society is the theme in the literary excerpts students examine and in their subsequent writing. The unit illustrates that selected details or items may suggest a number of generalizations, depending upon the point of view of the writer.

THE NATURE AND MEANING OF VIOLENCE

Jonathan Kozol

Violence as both a theme in literature and a part of the human condition is the focus of this unit, and discussion of the theme ranges from ethical justification to realistic assessment of our inner attitudes toward violence. Fictional and historical expressions of violence are explored through such literary works as Hemingway's "The Killers," Hersey's Hiroshima, and Shakespeare's King Lear, and through newspaper accounts of the execution of the Rosenbergs.

MAN VERSUS MACHINE

Robert Solem

In creating the machine, has man sown the seeds of his own destruction? The relationship between man and machine, the impact of technology upon society, and man's recurring anxiety that he may someday lose control of the machines he has built are examined in terms of the 20th century social and personal advantages and disadvantages of the "age of the computer," and a 19th century satire on the conditions and practices of Western Civilization, Erewhon by Samuel Butler.

ENGLISH UNIT IDEAS INITIATED DURING TEACHERS' WORKSHOP

The Sacred Calves	Mary Walker
Tales of Gods and Heros	Mary Walker
Form for Fun	Doris Adler
Form as Code	Doris Adler
The Faces of Silence	Cleo Gray
On Brecht's The Good Woman of Setzuan	Burton Melnick
Sifting Sands: A Unit on Status-Seeking	John Williams
The Aphorism: A Unit on Student Writing	Mason I. Lowance, Jr.
Real Estate and Imagined Estate: A Unit on Writing	Mason I. Lowance, Jr.
A Game of Password	Carol Reed
Experiencing with Drama	John Williams
Non-Realistic Fiction	Burton Melnick

17

(VI - 8)

An Annotated List of Mathematics and Science Units Produced at the Writing Conference

Summer 1966

MATHEMATICS UNITS

A Chain Loop Puzzle — Irving Adler

Using a chain of paper strips joined by paper fasteners, this unit considers the possibilities for forming triangles. The question posed, for a given loop of these strips, is how many different triangles can be formed. The investigation moves from empirical to analytic to abstract modes of looking at the problem.

Additions to Polygons and Symmetries — David Seligson

After looking at symmetries of two-dimensional figures and discovering the need for a place of reference, students are able to describe symmetry of three-dimensional figures. This unit encourages the students to observe all forms of symmetry -- in blocks, pyramids and even in nature.

A Problem About Divisibility — Irving Adler

This encourages independent and joint activity, problem-solving skills, and mathematical knowledge and skill. Students set up mathematical problems and solve them in a logical process -- defining terms (such as modulo and congruence) as they go. Some advanced mathematics is presented in a clear, interesting and meaningful way.

Classroom Use of Tic-Tac-Toe — Newcomb Greenleaf

Game-playing appeals to students, and Tic-Tac-Toe is such a familiar game that this unit can get off to a roaring start and move along very quickly. Game strategy is studied -- how to win, how to draw, and "what happens if . . ." Extensions and variations of the game are considered including changing the size of the board and the number of dimensions. Games in which one or more of the moves are made randomly are also analyzed and questions of probability are introduced.

I Doubt It

John Alexander

This unit is a card game in itself. The methods of winning are shared at the conclusion of the games and it becomes obvious that whatever methods the students employ to win will involve probability-type thinking.

Loonie Graphs

John Alexander

Plotting of points leads to outlines of well-known cartoon figures such as Charlie Brown. This leads to an analysis of equations associated with various lines in the cartoon figure.

Odds and Evens

Irving Adler

This unit gives the students an opportunity to make empirical observations, to observe regularities, to formulate conjectures, and to try to prove the conjectures. The mathematical concepts involved are probability, permutation, and the balance of odd and even integers under subtraction and multiplication.

Random Triangles

Newcomb Greenleaf

Some probability and geometry is presented and used as an introduction to inequalities and their graphs. A game serves as an introduction to the unit. The students discover interesting properties of triangles and go on to prove that certain figures are triangles. Other problems and games are introduced and data are recorded.

The Induction Game

Jack Alexander

Card-playing again stimulates group activity and the desire to win induces the players to discover the winning rule. One student forms the "rule", a not too difficult rule, and the other students are to guess what the rule is.

The Statistics of Dueling -- Some "Old Math"

William Nicholson

This short unit should give students some appreciation for mathematics done thousands of years ago. It is hoped that they will also see some of the motivation behind the ancients' acceptance of certain formulas. Further, students will be forced to do some analytical thinking.

BIOLOGY UNITS

ABO Blood Groups of Man

David Seligson

Many students have familiarity with the human red cell groups but lack an intuitive understanding of the underlying principles of blood grouping. Typically there have been units in which a drop of the student's blood has been tested against commercial antisera with the idea of finding out the student's type. The purpose of this unit then is to supply an appreciation for the fundamentals behind blood grouping.

Ages of Experimental Animals

Irving Adler

The purposes of this unit are to develop an appreciation of the fact that scientific problems frequently lead to mathematical problems, and then the solution of the scientific problem depends on the solution of the mathematical problem; that the solution of a mathematical problem is sometimes obtained by a process of trial and error; that students learn through the process to "discover" and solve a problem whose solution is simple and effective.

Camouflage Game -- Bugs and Birds

Jeff Camhi

The unit is a game. The players determine the stages of life of their birds and bugs "disks" by moving them on a board. The player with the largest population of living insects wins the game.

Cells and Physical Forces

John Rier

The aims of this unit are to show the variety of cell shapes in the body of a plant, to devise methods in the laboratory which may illustrate these shapes, and to construct models of the cellular organization found in plants. Students observe through a microscope the cellular shapes of Coleus and a bit of mashed tomato pulp.

Exploring Plant Cells

John Rier

This unit is designed to give students an opportunity to observe plant cells and tissue organization for similarities and differences in structure and composition. The teacher will simply make the suggested materials available for macroscopic examination and chemical tests. The students may design methods and procedures for examining the plant materials at the cellular level. There should result an appreciation for the careful work needed for understanding life at the cellular level.

Fick Principle David Seligson

This unit explores the techniques of measurement. By withdrawing and weighing a small number of objects from a large pool of objects students should be able to figure out the number of objects in the large pool. Several aspects of such a procedure can be discussed and extended into other problems.

Flies Jeff Camhi

This is a unit on the feeding behavior of flies. Students determine by experimentation whether a fly or a human being is more sensitive to the taste of sugar and then go on to test other tastes to which flies are sensitive.

Grass Jeff Camhi

In grass, the most common of plants, there is a whole complex world of structure. Only in an attempt to draw an actual grass blade does the student become aware of its detail and proportion. Several grass species can be discussed and investigated.

Coney Island Dave Pradell

This is a three-part unit designed for use in either a classroom or a lab. Part I is concerned with sampling large numbers, estimating, and becoming familiar with the use of exponents. In Part II, yeast, a fast growing population, is sampled under different environmental conditions. Part III covers two alternative methods of sampling populations indirectly.

Pollen John Rier

Hayfever, that age old sign of advancing spring, is caused often by pollen grains, immature male plants borne on the male parts of flowers or on staminate cones of trees in the Pine family. This unit is designed to show that pollen is an immature plant, to show variations in form, and to illustrate methods for the collection of pollen.

The Growth and Regulation of Populations Jeff Camhi

A hypothetical situation (originating sparrows on an island) is presented and through this simple situation students are able to predict rate of growth of the birds by naming conditions which aid or hinder survival and reproduction. Students can graph predictions and recognize probable outcomes thus regulating outcomes.

The Uptake of Water in Plants

John Rier

The *coleus* plant is once again the subject in this experiment. The unit aims to illustrate the phenomenon of water uptake in plants and to show a possible quantitative relationship between the structure and physiological activity and to provide an opportunity for a mathematical analysis of biological activity.

Weight Perception

David Seligson

The problem is to determine how well one can distinguish between different weights by estimating them with the hand. This unit is designed so that students discover for themselves Weber's Law, which states that no matter what the size of the objects considered, the percentage error of discrimination is a constant.

PHYSICAL SCIENCE UNITS

Gravity Units

Dane Morgan

This series of units includes topics entitled *Balloons*, *Motion Graphs*, *Pendulums*, *Ramps*, and *What Do You Mean Level*? The theme of the gravity units is to illustrate a way of moving the questioning process. All reasonable human beings are convinced that heavier objects fall faster than lighter objects and that an object dropped from a moving ship's mast hits the poop deck. These beliefs are founded in experience and cannot be discussed as sheer misconceptions. The units all begin with common situations which do not ignore air resistance and friction. The idealized view arises slowly and naturally from actual non-idealized events as the limiting case.

Balloons: The students are encouraged to predict the ratio of number of washers tied to a balloon to the rate of the fall of the balloon. They perform the actual experiments, graph the data and compare their prediction to the real result. More accurate predictions can be made when other hypothetical balloon problems are presented.

Motion Graphs: The study of motions is projected onto graph paper when students are encouraged to illustrate problems by drawing models and recording data. In this manner, the problem is more easily solvable and the workings are understandable.

Pendulums: The main purpose is to give experience in strong inference reasoning. Students compare and graph the behavior of balls rolling down ramps versus the swing of balls on pendulums.

Ramps: How things move on ramps of varying slopes and why is presented as a problem to be explained in theory. Several concrete problems are proposed and through solutions, students are able to discover the theory and express it.

What Do You Mean Level? This unit discusses the word "level" -- an every-day word that appeared with an important and complex background and history. The students learn how to determine what is a level object.

Sol-Terrella Marvin Fridley

If one orients a globe out-of-doors in the proper manner and fixes it with respect to the earth, he will see the globe being illuminated in exactly the same fashion as the earth is at that moment in time. Upon closer inspection and thought, a surprising number of facts can be "read off" or inferred for that day anywhere in the world. Over a prolonged period of time, the shift of the shadow can be correlated with seasonal events. The unit serves two broad purposes; it asks the student to engage in scientific model making at a fairly unsophisticated level and to test his model through short and long range observations.

The Sun Marvin Fridley

The main purpose of the unit shifts from the actual physical model of a reduced size to a more abstract form of model making: namely a pencil and paper representation that draws upon information that the students themselves observe and from reading and looking at data compiled by experts using sophisticated equipment.

The Moon Marvin Fridley

This unit can be used as a sequel to the Sol-Terrella Unit, or with modification it can stand alone. While unsophisticated, model making at this level can be enlightening in spite of the amount of exposure to the facts about the moon the students may have had both in and out of school. Basically the unit asks the question, "Can we construct a model of the moon and once having done so, what can we learn about the moon from our model?"

Writings in Science John Rier

This unit was designed to acquaint the student with materials written on certain events occurring in nature or in experiments, to provide an opportunity to examine scientific materals for style, and to create in the student a sense of responsibility to the reader when communicating information.

Math and Science Unit Ideas Initiated By Visiting Teachers at the Summer Writing Conference

Summer 1966

MATH UNITS

Variations on Crazy Dice	Will Riggan
Finite Differences: An Extension of Empirically Derived Functions	Sister John Elizabeth
Switches and Batteries into Set Theory	Sister John Elizabeth
Mirror Cards	Sister John Elizabeth
Set Theory	Sister John Elizabeth
Comments on Philosophy	Richard Gowell
The Illustration of Various Properties	Juanita Stiles
A Game Called Slope	Juanita Stiles
Not a Unit on the Illustration of Various Properties	Juanita Stiles
Suggestions for Math Units	Juanita Stiles
I Am A Simple Computer	Alice Hankla
More Hints for Euclidean Algebra	Alice Hankla
The Probability of Freedom	Richard Hatfield
Or ... And ... Maybe? A Journey into Doubt	Richard Hatfield
RUOF -- An Introduction To Systems of Numeration	Harold Tate
Topology and Networks	Virginia Merrill
Cryptography	Virginia Merrill
The Pivot Game	Gladys Richardson
Enrichment Units	Gladys Richardson

Proposal for Mathematics Workshop	Beverly Jacques
Statistics	John Ernst
Permutations and Combination Dance?	John Ernst
What is Topology?	Larry Rabinowtiz
Game of Pure Strategy	Colin E. Bell
From Clocks to Groups	Daniel Mosenkis

BIOLOGY UNITS

Beating Heart of the Earthworms	William Briggs
Diffusion	William Briggs
Suggestion for a Unit on Embryology	William Briggs
Extension of Diffusion	William Briggs

PHYSICAL SCIENCE UNITS

Radiation	Frances Jeter
Chemistry Workshop	Melvin Hodges
Chromotography	Riley Elliot
Measurement	Riley Elliot
Diffusion	Riley Elliot
Floating	John Ernst

VII. Evaluation

A formal evaluation study of the whole program is still in progress, begun under ESI direction, and now being continued by an independent group supported by the Office of Economic Opportunity. The Curriculum Resources Group relies heavily on teachers and counselors at each of the centers to conduct their own informal evaluation of the progress of the students, and also to supply feedback on classroom experience.

VIII. Teacher Training and Dissemination of Information Concerning Materials Produced

Teacher training and orientation sessions with demonstration classes are held at each of the centers before classes begin in order to acquaint teachers with the materials and techniques for using them effectively. In every case center directors were urged to invite teachers and administrators from neighboring schools and universities so that information about the program would spread. Sometimes students as well as teachers engage in discussion with the visitors. The orientation sessions are designed to involve teachers as much as possible in the process of innovation, and the program for these sessions include demonstration classes, discussions and preparation of new units. The Curriculum Resources Group has the increasingly important task of improving its capabilities for training and orienting teachers, and is considering the possibility of demonstration films as a possible aid in meeting the demand for demonstration classes.

IX. Materials Distribution

A few English and Mathematics units that have been tested and revised and edited have been printed in pamphlet form, and more are in process. Encouraging preliminary discussions have been held with publishers to discuss the possibilities of commercial publication.

During the summer of 1966 curriculum materials were provided to five Upward Bound centers in addition to the original six--Tufts in Boston, Bowdoin in Maine, Wesleyan in Connecticut, Tougaloo in Mississippi, and Prairie View in Texas. During the school year 1966-67 Curriculum Resources Group units have been used in a number of elementary and high schools in the Boston area and many requests have been received in the last few months from public high schools throughout the country. During the summer of 1967, the following Upward Bound centers are using CRG materials--in addition to the original six (Dillard, Fisk, Howard, Morehouse, Texas Southern and Webster)--Lane in Tennessee, Luther in Iowa, Clark and Paine in Georgia, Talladega in Alabama, Cranbrook in Michigan, Tougaloo in Mississippi, Prairie View in Texas, University of Virginia in Charlottesville, and the University of Massachusetts at Boston.

All this indicates two things: The immense and widespread need by schools all over the country for innovative curriculum which will be at the same time different from the usual material that obviously has had only a limited success with the intellectually discouraged students, and academically significant in a way that will motivate students to take an interest in learning and continue their educational career; and the dependence of these schools on an organization like the Curriculum Resources Group for guidance in revising their programs, their emphases, their attitudes, their materials. It seems imperative now that a variety of curriculum groups be encouraged to continue their work, lest school systems, which are today showing a greater willingness to experiment because of the availability of funds for "innovation", grow discouraged by lack of guidance and support and abandon their attempts.

Up to now, we have been talking about innovative materials which serve as supplements to a regular classroom curriculum. The most important need at this time, we feel, is sufficient staff, time, and funds to prepare an experimental curriculum in a variety of disciplines which would last a whole semester, and possibly an entire year, and the next step would be to find imaginative schools willing to substitute this term- or year-long experimental curriculum for their present one.